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NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

**STRIKE FROM THE SEA: SOF UNDERWATER
OPERATIONS IN GREAT POWER COMPETITION**

by

Aaron A. Taylor

December 2020

Thesis Advisor:
Second Reader:

Kalev I. Sepp
Barry S. Strauss

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**STRIKE FROM THE SEA: SOF UNDERWATER OPERATIONS
IN GREAT POWER COMPETITION**

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Submitted in partial fulfillment of the
requirements for the degree of

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ABSTRACT

The United States is in an era of renewed great power competition. This competition spans a multi-domain environment with a renewed focus on the maritime domain as China seeks to expand its global maritime influence. America's Special Operations Forces (SOF) have been involved in primarily land-based counterinsurgency for the last twenty years, and maritime and underwater operations capability has atrophied. This study examines the organizational structure and underwater operations record of the Italian Decima MAS frogmen during World War II. Utilizing Benjamin Jensen's theories on innovative organizations, and a statistical analysis, recommendations for U.S. SOF underwater operations potential within great power competition are provided, based on the characteristics of Decima MAS's successful organizational and operational examples.

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LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---------|---|
| AFCDC | Air Force Combatant Diver Course |
| AFSOC | Air Force Special Operations Command |
| ARSOF | Army Special Operations Forces |
| BUD/S | Basic Underwater Demolitions/SEAL |
| FMF | Fleet Marine Force |
| GPC | Great Power Competition |
| GWOT | Global War on Terror |
| MARSOC | Marine Special Operations Command |
| MAS | <i>Motoscafi Anti Sommergibili</i> |
| MCDC | Marine Combatant Diver Course |
| NDS | National Defense Strategy |
| NSS | National Security Strategy |
| ODA | Operational Detachment Alpha |
| OSS | Office of Strategic Services |
| RAF | Royal Air Force |
| RNCD | Royal Navy Clearance Divers |
| SCUBA | Self Contained Underwater Breathing Apparatus |
| SDV | Swimmer Delivery Vehicle |
| SEAL | Sea, Air, Land |
| SLC | <i>Siluro a Lenta Corsa</i> |
| SRU | Sea Reconnaissance Unit |
| UDT | Underwater Demolition Team |
| USSF | United States Special Forces |
| USSOCOM | United States Special Operations Command |
| UWO | Underwater Operations |

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This work is dedicated to all of America's Underwater Warriors past,
present, and future.

De Oppresso Liber.

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I. INTRODUCTION

A. PURPOSE

Since the end of World War II U.S. Special Operations Forces (SOF) has built and maintained a robust underwater operations capability. Although combat diving or combat swimming is most closely associated with the U.S. Navy SEALs, each SOF component within the Department of Defense possesses an underwater capability.¹ U.S. Army Special Forces in particular recognized a need for and developed the capability since its earliest inception as the original special operations unit capable of operating from the Air, Land, and Sea almost a decade before the creation of the Navy's SEAL teams.² In today's joint environment, underwater operations and the maritime domain are the responsibility of the entire SOF enterprise. The purpose of this study is to assess the role SOF underwater capability will play in the competitive space and in preparing for future conflicts with a peer level threats.

This chapter will establish why a greater maritime domain awareness and expertise for U.S. SOF is both relevant and essential to maintaining the competitive edge and imposing real costs on our adversaries. Once the context of the strategic environment is set an examination of the unique options U.S. SOF underwater capability can provide will be examined. Case study selection criteria and methodology for analysis will focus the scope of the study and provide a solid foundation for an accurate assessment of the potential utilization of underwater operations in the future. This study aims to answer three questions:

1. What role will SOF underwater capability play in Great Power Competition, and what capability gaps exist that must be addressed for the U.S. and her allies to remain competitive?

¹ Air Land Sea Application Center, *Multi-Service Tactics, Techniques, and Procedures for Military Diving Operations* (ALSA, 2019), x, <http://www/alsa.mil/>.

² Kenneth Finlayson, "Key West: Home of ARSOF Underwater Operations," *Veritas* 3, no. 1 (2007): 1.

2. What underwater capabilities must U.S. SOF be prepared to execute throughout the competitive space and conflict continuum?
3. How can SOF underwater capabilities be leveraged by, with, and through partner forces in the Competitive space?

B. CONTEXT AND CHALLENGES

While the joint operational environment of Iraq and Afghanistan has led to greater interoperability between U.S. SOF conducting joint and combined land operations the same “Jointness” among U.S. SOF does not extend to the maritime domain. As a result. While there is seemingly no doctrinal or institutional opposition to the U.S. Navy’s “frogmen” conducting land operations thousands of miles from the nearest sea, and in fact it has become the *status quo*; often the very suggestion of non-Naval SOF conducting maritime or underwater operations is met with great institutional resistance. This is despite both the doctrinal mandate and historical precedence for each SOF service to maintain an underwater capability.³ This study posits that this organizational resistance is normally attributed to three shortfalls:

1. Doctrine

Traditionally, the myriad U.S. SOF, core missions and tasks are required to be executed throughout a multi-domain environment regardless of service branch.⁴ Yet while there exists standardization and interoperability in underwater capability between U.S. SOF, the doctrinal guidance for the use of underwater capability by U.S. SOF is overly stratified, rigid, and conflict-focused.⁵ This doctrinal limitation ignores both the potential for underwater operations to provide a means to an end within the accomplishment of the various core tasks; and how underwater capability could provide a critical enabling skill in

³ Air Land Sea Application Center, *Multi-Service Tactics, Techniques, and Procedures for Military Diving Operations*, 1.

⁴ *Doctrine For Army Special Operations Forces FM 100-25* (Washington, D.C.: Headquarters Department of the Army, 1991), 1–1.

⁵ Air Land Sea Application Center, *Multi-Service Tactics, Techniques, and Procedures for Military Diving Operations*, 57.

the accomplishment of the core tasks across the spectrum of permissive through denied environments within the competitive space short of conflict.

2. Sea Blindness

“Sea Blindness” is a tendency for organizations primarily focused on land-based operations to ignore the maritime domain. While not unique to any single organization, these terrain-based blinders inhibit SOF planners from recognizing the maritime domain and littoral regions as maneuver space. Often opting instead to regard the maritime domain and the littorals as at best an obstacle to be overcome or avoided and at worst the sole responsibility of the conventional Naval services.⁶

3. Multi-domain Atrophy

Given the fact that the campaigns in Iraq and Afghanistan have been primarily land-based and have not provided a recent opportunity to highlight the efficacy or potential of SOF underwater capability, maritime and underwater domain awareness has languished and atrophied across the force. Worse yet, the lack of recent relevant operational examples has produced an active resistance at the unit level toward spending training time and resources on maintaining and developing SOF underwater capability.

These fundamental shortfalls have produced a disparity between doctrine, training, and operational employment within the SOF underwater operations community. This disparity comes at a time when a renewed emphasis on the importance of the maritime domain within the context of Great Power Competition has begun to highlight the potential contributions of SOF underwater capabilities within a holistic maritime grand strategy to counter the strategic aims of the adversaries of the United States.

C. ASSUMPTIONS, RESEARCH QUESTIONS, SCOPE

1. Assumptions

For the purpose of this study several assumptions will be made:

⁶ Meghan Curran Et Al., “Violence At Sea: How Terrorists, Insurgents, And Other Extremists Exploit The Maritime Domain,” Stable Seas, August 2020, 1.

- U.S. SOF will be required to operate in a multi-domain environment
- Military planners will seek SOF options that impose real costs within the competitive space vs. simply preparing for future high intensity conflict.
- U.S. adversaries' strategic goals will inform U.S. SOF strategic employment

2. Research Questions

This study asks the questions: What role will Special Operations undersea warfare play in Great Power Competition, and what capability gaps exist that must be addressed for the U.S. and her allies to remain competitive, what underwater operations capabilities must U.S. SOF be prepared to execute throughout the competitive space and conflict continuum, and how can these capabilities be leveraged to enable partner forces in the Great Power Competition arena?

3. Scope

The primary scope for this research is limited to underwater operations. While the broader importance of maritime operations will be touched on, the unique SOF capability of utilizing underwater breathing devices as a means to an end to accomplish a tactical task is the focus. Furthermore, while the duties and capabilities of all U.S. SOF underwater operations capable elements will be discussed in order to build an understanding of the status of U.S. SOF underwater forces, the primary focus for recommendations will center on U.S. Army Special Forces underwater capability in Great Power Competition.

D. RESEARCH METHODS

1. Primary

The primary research methods for this study will be both qualitative and quantitative. A qualitative analysis of the strategy, doctrine, organization, training, and equipment of the Italian Naval Commando unit the *Decima Mas* utilizing Benjamin M.

Jensen's theories of institutional mechanisms inherent to innovative organizations.⁷ A quantitative analysis of the *Decima's* twenty underwater operations throughout their thirty six month campaign during World War II utilizing the Bayesian statistical contingency method to measure the success probability will support the qualitative work.⁸ By these methods the necessary fundamentals of successful SOF underwater operations in a peer to peer level conflict relevant to Great Power Competition will be identified and measured.

2. Secondary

The secondary research method for this study will involve conducting interviews of current cadre and leadership at the John F. Kennedy Special Warfare Center Special Forces Underwater Operations School, Key West, Florida; the Naval Special Warfare Center, Coronado, California; the Marine Combatant Dive Course, Panama City, Florida; and the Air Force Combat Diver Course Panama City, Florida. These interviews will provide insight into status of the training institutions of U.S. SOF underwater operators, their tie-in with the operational force, joint-interoperability, and organizational structure.

E. CASE STUDY SELECTION

While there are many examples of maritime, riverine, and waterborne operations in modern Special Operations history since World War II, I have limited case study selection by certain criteria to focus the research and provide relevant output for U.S. SOF underwater operations potential in the context of competition between great powers. Once these criteria are adopted only the operational actions of the *Decima MAS* in World War II serve as a relevant case study with the necessary operational details for analysis.

1. Criterion I: Underwater Operations

By this I define Underwater Operations as those operations utilizing a self-contained underwater breathing apparatus for the operator in order to successfully conduct

⁷ Benjamin M. Jensen, *Forging The Sword: Doctrinal Change In The U.S. Army* (Stanford, California: Stanford University Press, 2016), 142.

⁸ Dennis V. Lindley, "The Bayesian Analysis of Contingency Tables," *The Annals of Mathematical Statistics* 35, no. 4 (December 1964): 1.

the operation or that at least provided a means to conduct a type of operation that would not otherwise be possible by other means such as surface swimming, breath hold or “skin diving.” This criterion rules out maritime operations by small boat or surface swimmer actions prior to the modern era and the invention of underwater breathing devices. It also eliminates the numerous surface swimming operations conducted by the U.S. Navy’s Underwater Demolition Teams (UDTs) during World War II and Korea prior to their adoption of SCUBA equipment.⁹ It also rules out any pure submarine or mini-submarine operations that did not require a diver to exit the submerged craft. Finally, the self-contained criterion rules out any underwater operations utilizing deep-sea diving equipment requiring an external gas-supply and tether to a tender surface or submarine vessel. Therefore, all U.S. Navy and U.S. Army engineer salvage diving and the deep sea diving conducted by Operation IVY BELLS divers from the USS Halibut (SSGN-587) is also outside the scope of this study.¹⁰ Submarine insertion operations where by the operators simply utilized the parent vessel for underwater transit before conducting the operation by free ascent swimming to the surface or by have the submarine surface decks-awash before launching small surface craft such as the type conducted by UDTs from the USS Perch (ASSP-313) during the Vietnam conflict is also outside the scope of case study criteria.¹¹

2. Criterion II: Peer Level Adversary

As this is a study concerned with Great Power Competition this criterion defines that an applicable case study is an example of peer or near peer conflict. By peer or near peer I define that the player state conducting the underwater operation must have executed against a state of equal or greater maritime strength. This makes the cases relevant to the current Great Power Competitive paradigm of both Great Power vs. Great Power such as the United States and China and a weaker proxy of vs. a Great Power. By this criterion, the

⁹ Navy Warfare Publication, *Naval Special Warfare NWP 3-05*, May 2013 (Norfolk, VA: Department of the Navy Office of the Chief of Naval Operations, 2013), 1–2.

¹⁰ John P. Craven, *The Silent War: The Cold War Battle Beneath the Sea* (New York: Simon & Schuster, 2001), 161.

¹¹ T.L. Bosiljevac, *SEALS: UDT/SEAL Operations in Vietnam* (New York: Ivy Books, 1990), 20.

single Naval Special Warfare limpet mine attack by SEAL Team Two combat swimmers against the *Presidente Porras* during the invasion of Panama, and the more recent Dutch underwater sabotage actions against Somali pirates are eliminated. These were each actions of a stronger state utilizing advanced technology and underwater capabilities against an adversary with little capability to defend against such an attack in the maritime domain.¹²

3. Criterion III: Sustained Offensive Operations

By this criterion I limited the case study selection to sustained operations that are offensive in nature and with multiple repeated actions or attempts by the same executing unit. Actions executed as a singular event provide little data of operational relevance of innovation or counteraction over time. The nature of Great Power Competition being defined by long-term sustained rivalry between near equals and their proxies a relevant study must include a degree of adaptation and innovation over time to be of any use. This eliminated one-offs such as the already mentioned SEAL Team Two limpet attack, and the sabotage of Somali pirate vessels. It also eliminated the UDT's first use of the Aqua-Lung to dive on the USS Pledge (AM-277) during the Korean War as this mission was both singular and, although executed in a combat zone, it was a recovery operation vs. an offensive action.¹³ Finally, this criterion also eliminated defensive operations such as harbor and mine clearance diving conducted by the Royal Navy Clearance Divers (RNCD) led by Commander Crabb to counter *Decima MAS* attacks at Gibraltar.¹⁴

F. CONCLUSION

The 2018 National Defense Strategy recognized that the United States was emerging from a period of strategic atrophy, with America's competitive military

¹² Bradford West, "Frogmen 2.0: Combat Swimmers in the Era of Great Power Competition" (Monterey, Naval Postgraduate School, 2019), 3.

¹³ Navy Warfare Publication, *Naval Special Warfare NWP 3-05*, 1–2.

¹⁴ Jack Greene and Alessandro Massignani, *The Black Prince and the Sea Devils: The Story of Valerio Borghese and the Elite Units of the Decima MAS* (Cambridge, Mass.: Da Capo Press, 2004), 129.

advantage eroded.¹⁵ This period of atrophy has been followed by a new period of strategic competition, most notably with China and Russia. A competitive *gray zone* that will be played out below the threshold of armed conflict, in a space between peace and war.¹⁶ Currently the United States faces China and Russia in a new era of Great Power Competition (GPC) reflective of the Cold War of the pre-9/11 era.¹⁷ Six years prior to the 2018 NDS publication's recognition of both atrophy and strategic competition then Chinese president Hu Jintao declared that China's objective was to become a great maritime power.¹⁸ Against this backdrop the United States and her allies face Chinese naval threats in the Indo-Pacific region that span the gamut from sovereignty issues over land features amidst China's island building program in the South and East China Seas, to the PLA Navy's increased presence, and China's use of Maritime militias and fishing fleets.¹⁹ For almost two-decades U.S. and NATO Special Operations Forces have organized, trained and equipped primarily to defeat Violent Extremist Organizations in the Middle East in what has been primarily land-based counterinsurgency operations. Yet Inter-state strategic competition is now the primary concern of U.S. national security.²⁰ Given the current global security situation and operational history of the last twenty years this study will highlight the current organizational and capability gaps that must be addressed in order for U.S. SOF underwater forces to remain relevant and competitive. It will also identify the unique opportunities U.S. SOF underwater operations capability could provide to enable the greater maritime grand strategy of the United States in the coming decades of Great Power Competition. This research will also provide solutions as

¹⁵ James Mattis, "Summary of the 2018 National Defense Strategy of the United States of America: Sharpening the American Military's Competitive Edge" (United States Government, 2018), 3, <https://cle.nps.edu/access/content/group/6822f009-30f3-46f5-9320-438777b06f0f/TSDM%2017/2018-National-Defense-Strategy-Summary.pdf>.

¹⁶ Lyle J. Morris et al., "Gaining Competitive Advantage in the Gray Zone: Response Options for Coercive Aggression Below the Threshold of Major War" (Santa Monica, Calif.: RAND Corporation, 2019), 3.

¹⁷ Mattis, "National Defense Strategy 2018," 1.

¹⁸ Michael McDevitt, "Becoming a Great 'Maritime Power': A Chinese Dream" (CNA Analysis & Solutions, June 2016), 3.

¹⁹ McDevitt, 6–9.

²⁰ Mattis, "National Defense Strategy 2018," 3.

to how underwater operations can provide SOF options to deter and resist belligerent nations through asymmetric capabilities exercised either unilaterally or through partner forces. These proposed future requirements will be evaluated against the current SOF communities primary formalized underwater operations instructional institutions to identify critical capabilities gaps, training shortfalls, and equipment limitations. Finally, organizationally innovative solutions that could be adopted to quickly and at low cost will be identified to address these gaps and provide a force in readiness for the future operational requirements identified in this study.

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II. LITERATURE REVIEW

A. INTRODUCTION

In Chapter I this research highlighted the potential for U.S. SOF combat diving operations as an enabling capability in countering the global maritime strategy of adversary nations. Chapter I also provided the framework for research design, case study selection, assumptions, scope, and limitations of the study. This chapter will highlight the literature reviewed to provide a background and foundational theories behind the study. The three areas of literature focus are: U.S. Strategy and Doctrine toward Great Power Competition, The role of SOF in the Competitive Space, and Special Operations Underwater Operations.

B. U.S. STRATEGY AND DOCTRINE

After almost two decades of counterinsurgency and counter-terrorist warfare the United States military has begun to refocus on Cold War era style Great Power Competition and Conflict namely with China and Russia and their proxies.²¹ In the 2017 the National Security Strategy highlighted the renewed importance of remaining competitive with China and Russia, while also signaling a shift from previous U.S. policies based on the idea that a prosperous and open China would eventually liberalize her.²² The 2017 National Security Strategy called for renewing America's competitive advantage after a period of strategic complacency, and recognized that America's military force had not kept-pace with emerging threats while her adversaries had become adept at targeting America's weaknesses below the threshold of armed conflict within the competitive space.²³ The 2018 National Defense Strategy (NDS) recognized the strategic atrophy of American military power, the erosion of traditional alliances, and the need for rapid innovation across all domains in order to be competitive. This guidance also recognized that strategic

²¹ Mattis, 1.

²² Donald Trump, "The National Security Strategy of the United States" (The White House, Washington, D.C., December 2017), 25, <https://cle.nps.edu/access/content/group/6822f009-30f3-46f5-9320-438777b06f0f/TSDM%2016/NSS-Final-12-18-2017-0905.pdf>.

²³ Trump, 27.

competition with China and Russia is the principle priority of the Department of Defense. Competition not conflict is the focus of the 2018 NDS, and as such an expansion of the competitive space while striving to avoid outright conflict is the focus.²⁴

C. THE ROLE OF SOF IN GREAT POWER COMPETITION

Despite the previous two documents' guidance and focus on GPC in April of 2019 the revised SOCOM commander's guidance recognized that while SOF provides the United States with unique capabilities, especially within the competitive space below conflict, "Countering VEOs that threaten the homeland and U.S. interests remains the top priority for USSOCOM."²⁵ This would seem to indicate that U.S. SOF capabilities serve in a secondary capacity to conventional capabilities within the context of Great Power Competition. Indeed, recent work on the subject also trends toward the idea of U.S. SOF, who has been at the forefront of the conflicts in Iraq and Afghanistan, taking a step-down to support the conventional force lead in the competition space. In recent work by Brands and Nichols on the changing role of SOF they argue that while the Global War on Terror or GWOT was the era of SOF a post-GWOT security situation will be something of a "cold shower" for SOF and require a change in training and culture for U.S. SOF forces accustomed to constant combat deployment cycles in order to adapt to the new roles they see SOF supporting within the era of Great Power Competition.²⁶ Namely, while they recognize that SOF will play key roles in gathering information and working with strategic allies to impose real costs on adversaries in a struggle for regional influence. All the while providing postured crisis-response forces; they also make the argument that as deterrence becomes increasingly more important SOF will shift into a supporting role as conventional forces take the lead in providing strategic deterrence.²⁷ Claire Graja on the other hand makes the argument that the role of SOF will not diminish but instead play an even more

²⁴ Mattis, "National Defense Strategy 2018," 2–4.

²⁵ Richard D. Clarke, "SOCOM Commander's Guidance and Priorities" (USSOCOM, April 24, 2019), 2.

²⁶ Hal Brands and Tim Nichols, "Special Operations Forces and Great-Power Competition in the 21st Century," American Enterprise Institute, August 2020, 3.

²⁷ Brands and Nichols, 6–8.

important role as Irregular Warfare is inherent to modern Great Power Competition, and U.S. SOF, namely U.S. Army Special Forces, provides the only force within the Department of Defense that trains for and conducts irregular and unconventional warfare operations. Therefore, SOF will become a key player as irregular warfare becomes a critical aspect to gaining competitive advantage.²⁸

D. SOF UNDERWATER OPERATIONS

As the United States leans forward to prepare for the next conflict with other peer-level nations it is worth looking back to case studies from history to advise the future. This is especially true when looking at options for the maritime domain and specifically when analyzing the future employment of SOF in the maritime and underwater realm. Case studies are especially relevant in that we are experiencing a return to a Cold War style emphasis on sea control and within such a context various case studies reveal SOF have historically played an important role in littoral and undersea operations.

Modern SOF history and specifically underwater operations history begins during World War II, and no study of the development of underwater operations would be complete without examining the operations conducted by the *Decima MAS*, an elite Italian Naval commando unit organized before the war that essentially wrote the book on combat diving operations, and is still in existence today. During World War II Italian frogmen conducted daring raids on British warships and allied shipping that would lead to some of the greatest asymmetric victories in Special Operations history.²⁹ Faced with the full might of the Royal Navy in the Mediterranean the outnumbered and outgunned Italians turned to an innovative special operations leader, Commander Valerio Borghese, and his newly created naval commando units to counter the British threat.³⁰ In a classic synergy of weapons, technology, and tactics the Italians developed and utilized underwater breathing

²⁸ Claire Graja, “SOF and the Future of Global Competition,” CNA Analysis & Solutions, May 2019, i–ii.

²⁹ William H. McRaven, *Spec Ops: Case Studies in Special Operations Warfare Theory & Practice* (New York: Presidio Press, 1996), 74.

³⁰ Greene and Massignani, *The Black Prince and the Sea Devils: The Story of Valerio Borghese and the Elite Units of the Decima Mas*, 1.

apparatus, modified torpedoes, advanced mines, and cutting-edge luminescent underwater navigation instruments to attack allied ships. The attacks took place not at sea where the vessels had maneuver room, but at harbor where they were most vulnerable.³¹ Borghese's own excellent first hand and well written account *Sea Devils* provides a primary source examining the struggles of the *Decima MAS* as they fielded new weapons and developed new tactics to face the might of one of the world's most powerful conventional navies. Building on Borghese's original work Naval historians Jack Greene and Alessandro Massignani wrote an account of Borghese and his Sea Devils after gaining unprecedented access to Italian Naval archives.³²

While these previous are both histories and document the facts of *Decima* operations the first modern analysis of a *Decima* operation appeared in Admiral William McRaven's thesis work while he was a student at the Naval Postgraduate School that became his well-known book *Spec Ops*. Admiral McRaven examined in-depth a single *Decima* Operation, the manned torpedo attack on British warships at Alexandria, as a case study toward his Theory of Special Operations.³³ This same operation was also the focus of Vincent P. O'Hara's analysis of the asymmetric advantage of underwater operations in attacking capital ships at harbor toward tipping the balance of regional sea control.³⁴ Certainly the Alexandria Operation is the most famous and well examined of the *Decima* operations. Recent analysis of underwater operations and their strategic effects by Brad West, building on Colin Gray's strategic utilization theory also examined the Alexandria attack among two other operations conducted by the *Decima* in his thesis on the strategic potential of Naval Special Warfare ship-attack operations by combat swimmers in the early phases of Great Power armed conflict.³⁵ Yet while previous work has examined particular *Decima* operations, no work has done an analysis of the entirety of the twenty underwater

³¹ J. Valerio Borghese, *Sea Devils* (London: The Anchor Press, 1952), 17.

³² Greene and Massignani, *The Black Prince and the Sea Devils: The Story of Valerio Borghese and the Elite Units of the Decima Mas*, xvi.

³³ McRaven, *Spec Ops: Case Studies in Special Operations Warfare Theory & Practice*, 100.

³⁴ Vincent P. O'Hara and Enrico Cernuschi, "Frogmen Against A Fleet: The Italian Attack on Alexandria 18/19 December 1941," *Naval War College Review* 68, no. 3 (Summer 2015): 135.

³⁵ West, "Frogmen 2.0: Combat Swimmers in the Era of Great Power Competition," 2.

operations the *Decima* carried out during their campaign within the context of Great Power Competition. Furthermore, while previous works cite the innovation of the unit in developing new underwater equipment, the dynamic leadership of the organization, and credit the *Decima* as the forerunners to the modern techniques of combat diving utilized by U.S. Special Operations divers to this day. They fail to apply a method of evaluating the various successes and failures of the *Decima* within the context of their overall campaign and naval strategy. They also fail to suggest how lessons-learned from a unit involved in full-scale combat operations can be applied to the strategic setting of Great Power Competition, a situation short of open-conflict.

As stated previously the Cold War is a highly relevant period to examine for military strategist now looking forward to options within Great Power Competition. The Cold War environment also provided a setting for a high degree of innovation and experimentation in undersea warfare due to the nature of the Soviet naval threat and the need for clandestine and covert action. Fortunately, some of the most highly classified undersea operations of the Cold War are now available for examination. The most famous and well documented of these operations was codenamed IVY BELLS and well documented in *Blind Man's Bluff*. Operation IVY BELLS delivered one of the greatest intelligence coups ever carried out against Soviet naval forces. The program itself is a lesson in innovation and compartmentalization of concurrent efforts. During these missions U.S. Navy Divers pioneered deep sea diving techniques while specially modified nuclear submarines delivered them to the seabed off the east coast of Russia in the Sea of Okhotsk. There they placed recording devices that taped the Soviet Navy's underwater cables, enabling U.S. naval intelligence to monitor the status and location of Soviet submarines throughout the Pacific for years. The current body of work on this operation focuses on the technology required and the integration of the specially modified submarines required for the missions.³⁶ Yet the success of IVY BELLS serves as an example of the clandestine advantage of underwater operations in intelligence gathering within the competitive space.

³⁶ W. Craig Reed, *Red November* (New York: Harper Collins, 2010), 244.

E. CONCLUSION

Currently the United States faces a new era of strategic competition with primarily China and Russia, a competitive arena that will involve struggle for control of the world's maritime domain.³⁷ Recent work has highlighted the importance of the maritime domain within China's global strategy and therefore the potential importance of underwater operations as a critical SOF capability to enable control of the sea by countering anti-access and area-denial weapons.³⁸ Yet while the United States has been focused on conducting counter-insurgency operations for nearly two decades U.S. Special Operations underwater capability and innovation has atrophied. Additionally, while strategic planners and policy makers have recently recognized the role that increased maritime dominance will play in the competitive realm, it has been primarily platform and technology focused.³⁹ There is very little to no research being conducted into the status and capability of U.S. SOF underwater units and if they are prepared to conduct missions like the ones carried out during World War II and the Cold War. Of even further significance, despite the recent recognition of the importance of irregular and unconventional warfare within Great Power Competition, is any examination of the role SOF underwater capability could play in irregular warfare. While the current work and study available seeks to exemplify the technology required to conduct unilateral operations, it fails to address critical questions of SOF indirect underwater capability such as: How U.S. SOF could leverage underwater operations equipment and expertise through partner or surrogate forces? How SOF underwater capability could augment conventional U.S. and allied forces? Finally, what is the role if any of SOF underwater capability as an asymmetric deterrent against U.S. adversaries within the context of Great Power Competition?⁴⁰⁴¹

³⁷ Mattis, "National Defense Strategy 2018," 1.

³⁸ Toshi Yoshihara and James R. Holmes, *Red Star Over The Pacific*, Second (Annapolis, Maryland: Naval Institute Press, 2018), 283.

³⁹ Wayne P. Hughes Jr., "Build a Green-Water Fleet," *Proceedings Magazine*, no. 144 (June 2018): 2.

⁴⁰ Vincent J. Goulding, "Back to the Future with Asymmetric Warfare," *Parameters* 30, no. 4 (Winter 2000): 1.

⁴¹ Paul K. Huth, "Extended Deterrence and the Outbreak of War," *American Political Science Review* 82, no. 2 (June 1988): 5, <https://doi.org/10.2307/1957394>.

III. DECIMA MAS ORGANIZATIONAL CASE STUDY

“I consider history to be impartially written for future generations: from the knowledge of their predecessors’ mistakes, they should learn not to commit them again.” — Prince Junio Valerio Borghese⁴²

A. INTRODUCTION

The previous chapter identified areas where gaps exist in the theory and application of potential application of SOF underwater operations capability to support a grand maritime strategy during an era of Great Power Competition. This chapter will introduce the methods utilized to conduct an organization analysis of the *Decima MAS* while they conducted underwater operations during World War II. An overview of the strategic context will provide the background for the creation of the unit, while their organizational structure will be compared to Benjamin Jensen’s theories of Incubators and Advocacy Groups in achieving innovative success.⁴³

B. STRATEGIC CONTEXT: ITALY AND GREAT BRITAIN

Before an analysis of the Decima Mas operations can be accomplished an understanding of the strategic context and background that led to the creation of the organization must be reviewed. According to Borghese the true beginning of the *Decima Mas* was on the 2nd Oct 1935, during the inter-war period. During this period Italian Naval planners faced with peer-level Great Power Competition between the Italian and British navies recognized that if Italy were to face the power of the British fleet in a future war in the Mediterranean any chance of success for the Italy could be immediately discounted from the start of hostilities. While the Italian navy possessed highly capable surface vessels, submarines, and the officers and crews to man them, the disproportionate advantage would go to Britain. The Royal Naval over-matched the Italian Navy both on the high seas and in the Naval air arm. Great Britain also had the advantage in industrial strength and capability

⁴² Borghese, *Sea Devils*, 22.

⁴³ Jensen, *Forging The Sword: Doctrinal Change In The U.S. Army*, 142.

over Italy. Finally, while the Italian Navy operated from their home country Britain enjoyed forward basing such as at Gibraltar to operate in the Mediterranean. Given this possible war-time scenario, Borghese described the pre-war outlook as such: Italy an island, bordered on each side by the sea and mountains to the north. They would be under siege, isolated on the peninsula and starved out by the British blockade.⁴⁴ This early strategic outlook reflects an emphasis on the naval theories of Alfred Thayer Mahan, particularly his ideas of the three pillars of sea power: shipping, both merchant and capital ships, economic and industrial might, and forward naval bases. in gaining naval superiority.⁴⁵

C. A SECRET WEAPON

1. Early Beginnings

Within this pre-war competitive space between Italy and Great Britain Italian naval planners theorized that perhaps a secret capability could be developed to offset the British advantage. Such a capability would have to be utilized: 1) Very early in the initial phases of any war. and 2) On a massive scale through multiple simultaneous strikes in varied locations. By this approach Italy could gain the advantage over Britain. In order to achieve these effects the capability would require both absolute secrecy and synchronization to have the greatest effect in maximizing surprise and evading enemy countermeasures.⁴⁶ Two sub-lieutenants, Teseo Tesei and Elios Toschi, both members of the Flotilla based at La Spezia had been examining exactly this problem set for years. Inspired by the actions of Lieutenant Raffaele Paolucci, a surgeon and Major Raffaele Rossetti, a Naval Engineer, who had sunk the *Viribus Unitis* at the mouth of the Pola harbor in November of 1918.⁴⁷ They had done so by riding astride an eight-meter long torpedo running on compressed air to penetrate the harbor at Pola after being released from a *Motoscafi Anti Sommergibili* (antisubmarine motorboat) or MAS, one kilometer outside the defenses. This early effort

⁴⁴ Borghese, *Sea Devils*, 11.

⁴⁵ Alfred Thayer Mahan, *The Influence of Sea Power upon History 1660-1783* (New York: Dover, 1987), 71.

⁴⁶ Borghese, *Sea Devils*, 12.

⁴⁷ Borghese, 12–14.

had been crude, the pilots controlled the speed of the torpedo by regulating the amount of air being released in a manner akin to slowly letting air out of a SCUBA cylinder. Steering the torpedo left and right was ponderous and only accomplished with their bodies as the device did not have controls or moveable control surfaces. Even given these limitations they were able to penetrate the seven layers of harbor defense and fix their detachable charges to the side of the *Viribius Unitis* before being captured. At dawn on the 1st of November muffled explosions were heard and the *Viribius Unitis* promptly capsized.⁴⁸

2. The Birth of the Decima MAS

It was with this national and naval history as inspiration, and with the Mahanian struggle for sea control in mind that Lieutenants Tesei and Toschi began work on a new “manned torpedo” the *Siluro a Lenta Corsa* (slow torpedo) or SLC.⁴⁹ Four other men joined their ranks and formed the nucleus of the *Decima Mas* (Tenth Light Flotilla) or *Decima* in 1936. The small unit quickly organized into Research and Construction, Training, and Operational Employment departments with respective responsibilities.⁵⁰ Despite these humble beginnings elements of this early organizational model would remain in place throughout the duration of *Decima* operations during World War II and will be examined further as a critical element of future success.

3. Institutional Challenges

As is often the case for many new and innovative weapons promising to rebalance the fight, there were true believers on both sides. On the one side, given early demonstrations and the perceived effectiveness and stealth of the weapon, supporters advocated that surface fleets would now be obsolete. While others maintained the more traditional notion that capital ships of the line armed with guns would remain the supreme factor in naval power.⁵¹ Early resistance to the new ideas of employment for the weapon

⁴⁸ Greene and Massignani, *The Black Prince and the Sea Devils: The Story of Valerio Borghese and the Elite Units of the Decima Mas*, 3–7.

⁴⁹ Greene and Massignani, 12.

⁵⁰ Borghese, *Sea Devils*, 16.

⁵¹ Borghese, 16.

was organizational as well as operational and generated by the deep-seated bureaucracy within the Naval tradition. Besides resistance to the unconventional nature of the weapon itself, the question of allowing two engineers who had developed the craft to also be its pilots was considered absurd. An SLC was considered a naval craft to be commanded or piloted and command and piloting was reserved for officers of the line, deck officers, not engineers.⁵² Given the internal bureaucratic friction, the institutional distrust, a lack of a solid concept of employment for the weapon or agreement of what its true potential was, the fledgling unit was denied adequate resources and by 1936 as the war in Africa terminated the ideas were shelved and the men reassigned until 1938.⁵³ Borghese reflects that this two-year setback denied the Italian Navy the opportunity to deliver the “early blow” originally envisioned to have the greatest effect against the British fleet.

4. First Operational Tests

It was only once war in Europe was imminent that there was a renewed interest in further developing the weapon and training the operators so that by 1940 the first operational demonstration could be achieved.⁵⁴ Although the original manned torpedo attack was launched from a surface craft, it was envisioned that these new SLCs would be air-mobile and deploy from a float plane landed at sea near the target. This proved unfeasible in testing and it was decided that they would be submarine carried and launched.⁵⁵ With Borghese in command, the first operational test of three SLCs launched from the submarine *Ametista* was conducted in the Gulf of La Spezia in 1940. During the exercise one vehicle and crew was successful in placing a dummy charge on their target.⁵⁶

⁵² Borghese, 17.

⁵³ Borghese, 18.

⁵⁴ Borghese, 22.

⁵⁵ Borghese, 17–20.

⁵⁶ Borghese, 20.

D. ORGANIZATION, SELECTION, AND TRAINING

1. Organization

a. The Underwater Division

Although the *Decima Mas* contained both surface and underwater groups, it is the activities of the underwater group that this study is concerned with. In a reflection of the original nucleus of the force the underwater group contained within its organization elements for Planning, Research and Development of Materials, and Training. Of special note is the inclusion of the parent transport submarines within the underwater group (Borghese was initially dual-hatted as the commander of the underwater group and of the submarine *Scire*) this provided organic dedicated submarine assets available during all phases of training, planning and operations. The underwater division consisted of the “pioneer” diver training center, piloted torpedo training center, the transport submarines, and the sabotage groups.⁵⁷

b. Research and Development

In a fusion of military organization and private industry that was ahead of its time Commander Belloni was put in charge of the sub aquatic research center to study “technical problems of human life underwater” and authorized to correspond directly with private firms for technological innovation. As an example, close collaboration with Pirelli led to the development of both the breathing devices and rubber dry suits worn by the operators.⁵⁸ (Although the rubber dry suits were manufactured by Pirelli they are still often referenced in the literature as the “Belloni suits” after the commanding officer who was instrumental in their development.) Borghese notes the unique organizational structure of the *Decima*’s underwater division was necessary for, “A fusion between professional and civilian staff and co-operation between medical, scientific, inventive, engineering, maritime and

⁵⁷ Greene and Massignani, *The Black Prince and the Sea Devils: The Story of Valerio Borghese and the Elite Units of the Decima Mas*, 270.

⁵⁸ Borghese, *Sea Devils*, 48.

industrial producers which is indispensable in achieving maximum results in military effort.”⁵⁹

c. *Decentralized Command*

In addition to selection, training, and research and development, the *Decima* enjoyed a unique status for operational planning as well. The Italian Naval leadership had begun to realize, through Borghese’s and others’ advocacy, the potential of the new weapon and in a departure from conventional naval operations gave the *Decima* and its leadership a free hand to plan operations.⁶⁰ In coordination with the rapid technological innovation capability, this decentralization of control stimulated the initiative of the every individual and shortened the time an idea could be tested, trained on, and executed while maintaining a form of compartmentalization from the greater force and therefore secrecy (a constant problem within the Italian Navy).⁶¹ This organizational agility would prove valuable in the future for the reorganization, rebuilding, and training of new operators and new leadership and the adoption of revised technology and tactics after failures and sustaining losses such as they would see at Malta.⁶² Borghese relates that this organizational construct, and autonomy enabled a culture within the *Decima* that was unique from the traditional naval construct. The officers and men were united by a “culture of excellence.” The *Decima* officers lead by example rather than through orders. While officers and enlisted competed in a friendly rivalry of skill and courage.⁶³

2. *Selection and Training*

a. *SLC Pilots*

Selection and training of the men that would pilot the SLCs required what Borghese described as a “strict weeding out process,” with an emphasis on the stamina required for

⁵⁹ Borghese, 49.

⁶⁰ Borghese, 49.

⁶¹ Borghese, 49.

⁶² Borghese, 114.

⁶³ Borghese, 50.

sustained operations in the hazardous environment of the sea. Ultimately each man had to inspire confidence in his physical and mental strength, before an interview with the Commander who had the last word on if he would be allowed into the organization.⁶⁴ Borghese when speaking of the type of cool-headed and resilient nature one must be to employ the “insidious weapon” of the torpedo.⁶⁵ In order to expand the pool of likely recruits with the necessary temperament for SLC piloting selection was widened to the entire navy to allow the best candidates to apply without restriction.⁶⁶ After initial training of underwater breathing equipment or “pioneer school,” the candidates transitioned to manned-torpedo or SLC training. The SLCs were not an intuitive craft to pilot and as such experience had taught them that a good torpedo pilot needed at least a year of training to become skilled enough to attempt a harbor penetration and ship-attack.⁶⁷ The SLC training pipeline consisted of four phases. In phase one the future SLC pilots learned how to maneuver their SLCs in a simulated approach to an enemy harbor. In phase two they learned how to lock-out or exit the transport submarine. Phase three consisted of learning the techniques for breaching underwater obstacles protecting the harbors. In phase four they learned to detach the warheads of their SLCs and attach them to enemy ships.⁶⁸ Once qualified sustainment training consisted of twice a week conducting a night-time launch from a parent submarine or surface vessel for a full-mission profile simulated attack against moored ships at harbor.⁶⁹ During the training the *Decima* devised a safety standard for training still in use today by SOF diving organizations. A Diving Supervisor and Dive Medical Technician or Diving Medical Officer was stationed topside in a safety vessel accompanying every training dive. The *Decima* had learned that due to the likelihood of equipment failures and the nature of the physiological stresses of oxygen diving and cold water on the men that this was the surest way to maintain safety and medical support

⁶⁴ Borghese, 32.

⁶⁵ Borghese, 21.

⁶⁶ Borghese, 48.

⁶⁷ Borghese, 33.

⁶⁸ Greene and Massignani, *The Black Prince and the Sea Devils: The Story of Valerio Borghese and the Elite Units of the Decima Mas*, 26.

⁶⁹ Borghese, *Sea Devils*, 50.

standards in a training environment.⁷⁰ Figure 1 is a sketch depicting a typical SLC operator, of note is the bulky dry suit and long duration oxygen rebreather.



Figure 1. SLC Pilot⁷¹

b. Gamma Group

During their operational employment, the *Decima* expanded their organization. In addition to the original SLC pilots the *Decima* formed a new group the “Gamma Group”

⁷⁰ Borghese, 51.

⁷¹ Borghese, Inside Cover.

or assault swimmers. Based on their experiences trying to penetrate the harbor at Gibraltar while a significant amount of allied shipping remained at anchor in the open and unprotected roadstead of the Bay of Algeciras, a new tactic had emerged. SLCs, with their large 300 kilogram warhead would continue to be tasked to attack warships (the larger charge deemed necessary to breach armored hulls), while Gamma men would swim armed with multiple smaller charges carried around their waists capable of breaching the lighter steamer hulls.⁷² In contrast to the SLC training pipeline, selection and training of Gamma men emphasized swimming and navigation. Selection of volunteers for this service required men who were excellent swimmers and had “water worthiness.” The list of the men in the Italian Swimmers League provided an initial means to recruit the best natural swimmers from civilian life, and the other branches of service. Recruiting for the Gamma Group was a true joint endeavor that emphasized the individual aptitude of the man instead of what service he was in. As such most of the swimmers who filled the ranks of the Gamma Group came from the Army where they had already been recruited for their athletic prowess. This joint recruitment effort led to extremely close collaboration of the *Decima* with the other branches of the service, a first for the Italian Armed Forces.⁷³ This new approach to required new training techniques and led to new equipment requirements. The Gamma Group were the first to utilize rubber swim fins, submersible wrist mounted compass, watch, and depth gauge. A basic combination still in use by combat swimmers today. The Gamma training pipeline utilized the Pioneer schools existing facilities because of the swimming pool. This was necessary for refining the swimming technique required for Gamma operations. The Pioneer school also provided the necessary logistical support for the rebreather training of the Gamma swimmers.⁷⁴ Figure 2 is a sketch depicting a typical Gamma swimmer, note the streamlined Pirelli rubber suit, the camouflaged headdress, shorter duration rebreather, mines carried around the waist, and the rubber swim fins, in contrast to the SLC operator.

⁷² Borghese, 116–17.

⁷³ Borghese, 120.

⁷⁴ Borghese, 118.



Figure 2. Gamma Swimmer⁷⁵

E. TECHNOLOGICAL INNOVATION AND EQUIPMENT

1. SLCs

From the beginning the Decima was a highly technical and innovative organization. The original reason for the creation of a new arm of the Italian Navy in the first place stemmed from the creation of the manned torpedo or SLC. Originally a modified torpedo, in its final iteration it was a purpose built and sophisticated craft. It carried two men sitting astride in tandem wearing rubber dry suits and pure oxygen rebreathers manufactured by Pirelli that could provide six hours of submerged time.⁷⁶ The SLC had a maximum speed of 2.5 mph., a max depth of 30 meters, (often exceeded during their operations), and a max

⁷⁵ Borghese, Inside Cover.

⁷⁶ Borghese, 25.

range of ten miles. Its batteries provided electric power, and the pilot console had a depth gauge, compass, and voltmeter. The nose of the craft was a detachable 300 kg explosive charge that would be clamped to a line running from the bilge keels. The men carried tools onboard for breaching harbor defenses such as net lifters, net-cutters, and scissors.⁷⁷

Technological adaptation and development of the SLCs was continuous. The *Decima* used the summer months, with their long days and short nights that were not good for operations, to overhaul and R&D the SLCs based on the lessons learned and feedback from the operators during training and operations. The *Decima* worked closely with private industry directly to speed the process of updating the SLCs and their transport submarines.⁷⁸ Initially the 30-meter depth limitation of the SLCs limited the depth capability of the transport submarines. The invention of steel cylinders to house the SLCs on the deck of the support submarines while in transit solved this issue and was later copied by other Navies.⁷⁹

2. Gamma Group

Gamma Operators wore a lighter version of the Pirelli rubber dry suit nicknamed the “The Belloni.” They were also equipped with a smaller lighter version of the pure oxygen rebreathers that utilized counter-lung breathing bags and soda-lime canisters good for only thirty minutes compared to the six hours of the SLC versions.⁸⁰ In contrast to the SLC pilots Gamma men swam on the surface to their targets before submerging for a short duration on final approach to set their charges before swimming away from their target on the surface. They were equipped with rubber swim fins to assist their swimming technique. To camouflage on the surface they blacked out their faces and wore a head net of flotsam and seaweed.⁸¹

⁷⁷ Borghese, 24.

⁷⁸ Borghese, 115–16.

⁷⁹ Borghese, 30.

⁸⁰ Borghese, 25.

⁸¹ Borghese, 117.

The original explosive device developed for Gamma swimmers was nicknamed the “leech” mine. It was a 2 kg mine that utilized air suction to attach to the hull of a ship. Each Gamma swimmer carried four to five mines around the waist. A second larger version was developed dubbed the “bug.” It was a 3 kg shaped charge, with an inflatable ring and cartridge that would ensure it remained at the bottom of the hull below the bilge keels. Both types of mines were equipped with a mechanical time fuse.⁸² The final most advanced version of the Gamma weapons was the “limpet.” A dramatic improvement over the bug, it was a truly innovative device. It contained a 4.5 kg high explosive shaped charge secured to the bilge keel by clamps. Rather than a mechanical timer activated by the diver it utilized a time and space fuse that activated the timer by propeller once it was turning revolutions for 5 mph. This gave the dual advantage of sinking a target vessel at sea in deeper water where it could not be salvaged and in that it left the enemy to believe their vessel had been torpedoed and was therefore non-attributable to Gamma swimmer activity.⁸³

F. ORGANIZATIONAL ANALYSIS

1. Foundational Theory

Utilizing Benjamin Jensen’s theory of how doctrinal change occurred in the U.S. Army over a thirty-year period we can evaluate the organizational structure and culture of the *Decima* to reveal certain parallels inherent to the early structure of the Decima underwater division and what Jensen identifies as necessary for an organization to innovate. In Jensen’s study he highlighted the unique role knowledge networks played in allowing new ideas to form and spread in an otherwise rigid bureaucracy. The bureaucracy he examined, the U.S. Army, was by its nature resistant to change in the same manner that the Italian Navy was also resistant to the idea of a new subversive and unconventional approach to naval warfare. Jensen’s case study revealed two institutional mechanisms that enabled innovation despite the overarching bureaucracy. He labelled these: Incubators and Advocacy Networks.⁸⁴

⁸² Borghese, 117.

⁸³ Borghese, 119.

⁸⁴ Jensen, *Forging The Sword: Doctrinal Change In The U.S. Army*, 142.

a. *Incubators*

According to Jensen, “Incubators, informal subunits established outside the hierarchy, provided a safe space where officers could escape the iron cage of bureaucracy.”⁸⁵ Within these “safe spaces” officers could form new ideas and explore alternative methods of victory through critical analysis and organizational speculation. An Incubator is a forum for the sharing of ideas of how to fight and win in current and future conflicts.⁸⁶ Broken down Jensen identified three properties common to Incubators:

- Officers frame problems through careful study and analysis.
- Problem-driven simulation is used to refine new concepts.
- Size matters, small is beautiful. The most innovative work and imaginative thinking is done by small cohorts.⁸⁷

b. *Advocacy Networks*

Jensen defines Advocacy Networks as the pathways that provide the connective tissue between Incubators and the greater community. New ideas formed within Incubators flow out through these “contagion vectors” that infect others with new ideas.⁸⁸ Jensen further defined two key fundamentals for Advocacy Networks to be effective:

- Advocacy Networks require senior leadership protection. Without their stamp of approval, change is impossible in a hierarchical organization.⁸⁹
- The brokerage of new ideas is critical to infection pathways.⁹⁰

⁸⁵ Jensen, 142.

⁸⁶ Jensen, 142.

⁸⁷ Jensen, 144.

⁸⁸ Jensen, 142.

⁸⁹ Jensen, 146.

⁹⁰ Jensen, 145.

2. Theory Applied

Building on Jensen's theory of the relationship between Incubators, Advocacy Networks, and Senior Leadership we can create an organizational model of Incubators and Sub-Incubators. That is, small groups within an organization that is already an Incubator inside the greater bureaucracy. With this sub-division we can further divide into internal and external Advocacy Networks. Internal Advocacy Networks provide pathways for ideas to flow between the Sub-Incubators but within the confines of the Incubator. In the same manner that Senior leadership was identified by Jensen as required for the protection of Advocacy Networks, leadership within the Incubator can provide protection or Internal Support of the Internal Advocacy Networks linking the Sub-Incubators. Internal Leadership also serves the dual function of vectoring External Lines of Advocacy to outside Senior Leadership or Supporters to continually influence their support of the Incubator within the Greater Organization itself. Figure 1 provides a possible graphic representation of this organization.

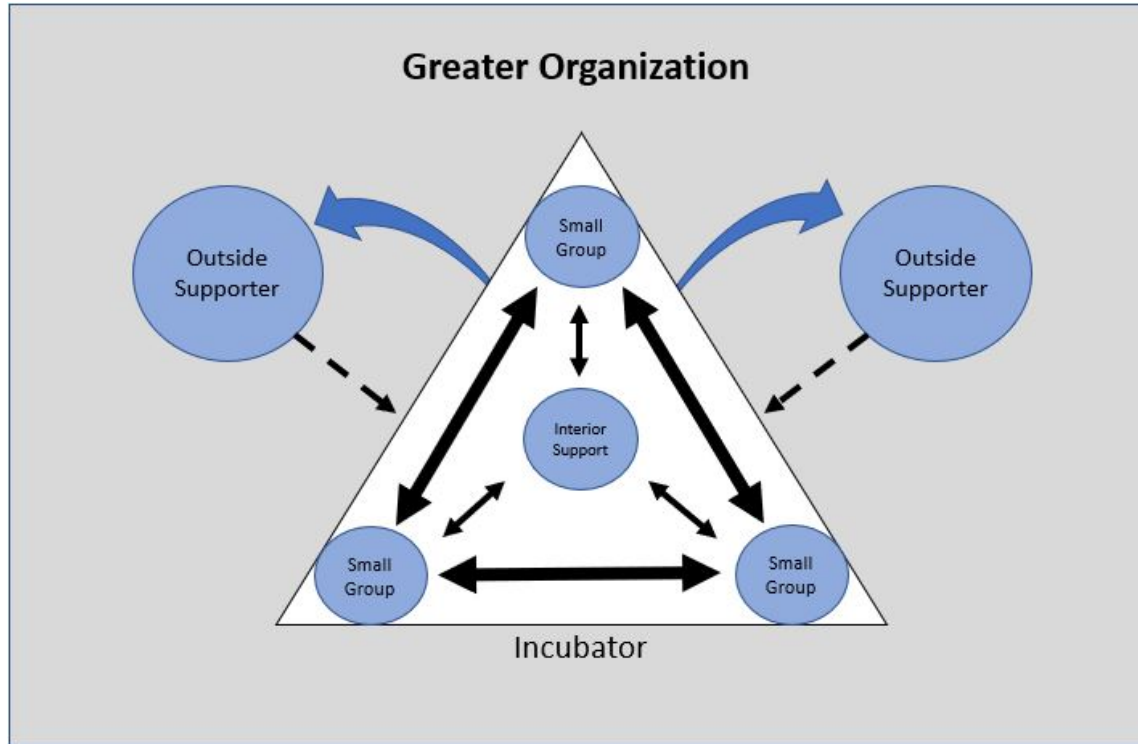


Figure 3. Incubator and Advocacy Networks Model

3. Jensen's Theory and the Decima MAS

We can now apply this model to the organization of the *Decima MAS* Underwater Division. As we have already seen the *Decima* organized very early into small groups for operational planning, research and development, and training.⁹¹ Each of these departments served as Sub-Incubators for new ideas within the primary Incubator of the Underwater Division. Furthermore because of the nature of the constant technical development of the diving equipment, the manned torpedoes, and the various munitions employed by the Gamma swimmers a constant feedback loop between the small groups served as Internal Advocacy Networks between the Sub-Incubators within the Incubator.

Meanwhile, Senior leadership such as Commander Borghese himself provided a high degree of approval for the constant flow of information along the Advocacy Networks between the Sub-Incubators. Borghese also served in the critical position of vectoring outside support for the *Decima* through frequent engagement with Italian Naval leadership and even King Victor Emmanuel III.⁹²

Figure 4 represents the Organization model applied to the *Decima MAS*. Arrows represent the brokerage of new ideas along Advocacy Networks between the Incubators and the Support of Senior Leadership toward those Advocacy Networks. Within the Incubator are the Sub-Incubators of the Operations, Training, and Research & Development Departments. Internal Command and Control provides both Senior Leadership approval of the Advocacy Network linking the Divisions and serves as a fourth Sub-Incubator of ideas resulting in an extremely “flat” organization with no information “stovepipes.”

⁹¹ Borghese, *Sea Devils*, 16.

⁹² Greene and Massignani, *The Black Prince and the Sea Devils: The Story of Valerio Borghese and the Elite Units of the Decima Mas*, 89.

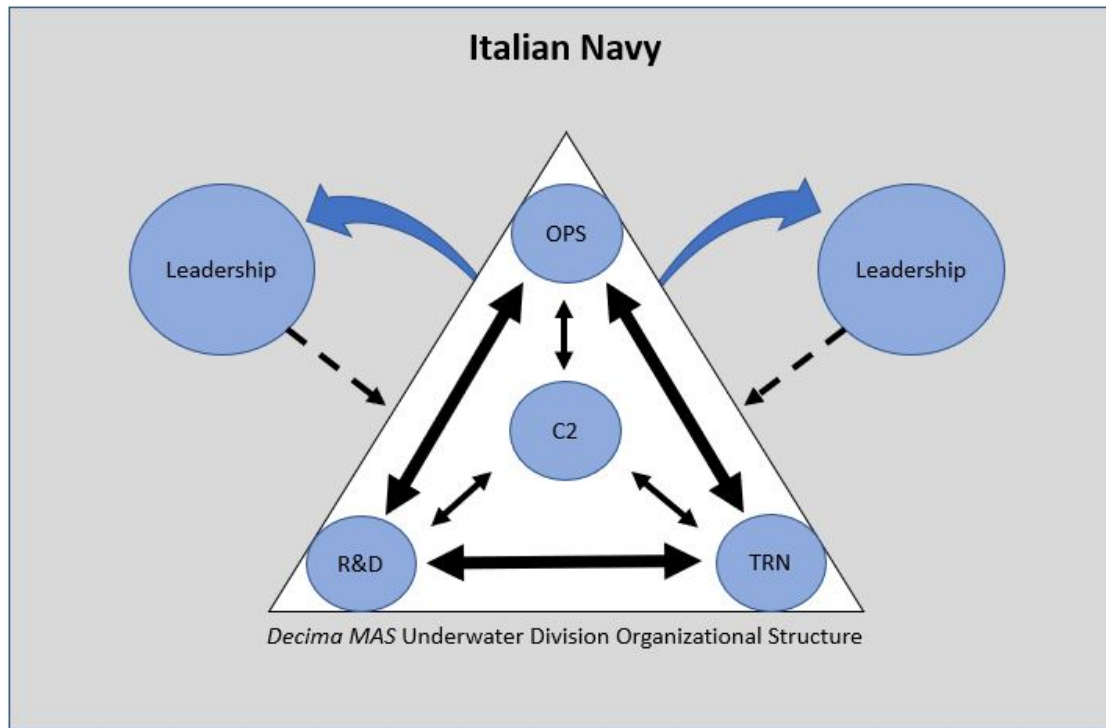


Figure 4. Model Applied to Decima Organizational Structure

G. CONCLUSION

Benjamin Jensen's theories serve well as a foundation for a model of the structure of the *Decima* underwater division. The *Decima* organization contained the elements Jensen identified as necessary for an organization to be capable of innovation.⁹³ Namely the *Decima* organization exemplified the three properties common to Incubators. The three properties rewritten for the specific organization:

- Decima Operators framed their problem set through careful study and analysis at the Strategic, Operational, and Tactical Levels.
- Realistic full-mission profile training, and operational feedback was used to refine new concepts.

⁹³ Jensen, *Forging The Sword: Doctrinal Change In The U.S. Army*, 142.

- The *Decima* organized their Training, Research & Development, and Operational Planning divisions into small cohorts to encourage the most innovative work and imaginative thinking.

While new ideas may be formed within an Incubator, they require Advocacy Networks in order to be adopted and for the organization to innovate.⁹⁴ The *Decima* also contained Jensen's fundamentals of Advocacy Networks within their organizational structure as well. If the fundamental statements are rewritten:

- Decima leadership provided the necessary senior level top-down support to encourage change.
- New ideas were shared and encouraged from all levels of the organization and across the separate Divisions.

The *Decima MAS* was an extremely innovative organization, that was capable of rapidly revising strategy, doctrine, tactics, and the training to support them. They were also able to field cutting edge equipment innovations at an extremely rapid pace to support changes in operational employment. This was no small feat for a relatively small organization existing within the structure of the larger conventional Italian Navy or what Jensen labelled the "Iron Cage of Bureaucracy."⁹⁵ Yet the key to their ability to so rapidly shift their strategy and adopt new weapons and tactics was no accident. From the start the *Decima* was organized to be successful at encouraging and adopting innovative ideas.

⁹⁴ Jensen, 142.

⁹⁵ Jensen, 142.

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IV. DECIMA MAS OPERATIONS CASE STUDY

A. INTRODUCTION

The previous chapter examined the strategic context of the formation of the Decima MAS and the construction of the SLC as a weapon to offset Royal Navy overmatch in the Mediterranean. Chapter three also compared the organizational structure of the *Decima MAS* underwater division to Benjamin Jensen's theories on the elements necessary for a military organization to innovate. Previous work on *Decima MAS* operations have focused on the strategic effects of *Decima* ship-attack operations.⁹⁶ To focus this research on relevant lessons-learned a comparative analysis of each operation and the elements that led to success will be done. As a function of this comparative analysis, "success" must be defined for each operation. The traditional method in previous work is to label those Decima operations that resulted in a successful ship attack as a success. While this binary method is useful when the focus is on the effects of the operation rather than the elements of the operation itself it fails to take into consideration the complexity of the current geopolitical situation when compared to the environment of full-scale conflict during World War II.

B. EARLY FAILURES AND SETBACKS

1. Submarine Iride SLC Attempt against Alexandria 25–26 August 1940

In the *Decima's* first attempt the submarine *Iride* departed La Spezia for the Gulf of Bomba where she was scheduled to make a daylight transfer of four SLCs and their operators from the torpedo boat *Calipso* before continuing on to Alexandria.⁹⁷ During the transfer they were attacked by British torpedo planes. This resulted in the loss of *Iride* and the support ship *Monte Gargano*. The SLCs were recovered later by their operators who

⁹⁶ West, "Frogmen 2.0: Combat Swimmers in the Era of Great Power Competition," 1.

⁹⁷ Greene and Massignani, *The Black Prince and the Sea Devils: The Story of Valerio Borghese and the Elite Units of the Decima Mas*, 51.

had survived the sinking of the *Iride* only because they were outside the submarine facilitating the SLC transfer when she was attacked.⁹⁸

Analysis – Failure: Eager to utilize the SLCs as an early decisive option the *Decima* rushed this operation before their equipment was fully ready. The SLCs could not exceed a depth of 30 m when transiting on the back of a host submarine. This depth limitation in transit combined with a desire to keep the SLC operators fresh was the deciding factor that led to the fateful transfer of the SLCs to the *Iride* at the Gulf of Bomba. Poor planning led to a cluster of vessels on the surface in shallow and isolated waters off the Gulf of Bomba, with no friendly air cover. Unknown to the Italians the flotilla was compromised early when a British submarine spotted the *Calipso* in transit and notified the Royal Air Force (RAF) who in turn passed the information to a Swordfish torpedo bomber group stationed on the HMS *Eagle*.⁹⁹ The limitations imposed by the depth limitations of the SLCs in transit astride a parent submarine would lead to the development of dry enclosures to house the SLCs in transit and allow the transport submarine its full operational depth capability during transit and insertion.¹⁰⁰

2. Submarine Gondar SLC Attempt against Alexandria 29 September 1940

A month after the failed attempt by the *Iride* a second attempt was made to attack Alexandria. On the night of 29 September, the submarine *Gondar* with three SLCs and six operators arrived off Alexandria. Once surfaced and about to begin the launch of the SLCs she received radio traffic that the British fleet had departed the harbor of Alexandria. She was then caught on the surface by allied anti-submarine forces. The *Gondar* crash-dove to evade but was pursued and depth charged by three surface vessels for twelve hours until she was forced to the surface. The crew scuttled the ship, resulting

⁹⁸ Borghese, *Sea Devils*, 34–38.

⁹⁹ Greene and Massignani, *The Black Prince and the Sea Devils: The Story of Valerio Borghese and the Elite Units of the Decima Mas*, 52.

¹⁰⁰ Greene and Massignani, 50.

in the loss of the *Gondar*, the three SLCs she carried, and the capture of her entire surviving crew by the British.¹⁰¹

3. Submarine Scire SLC Attempt against Gibraltar 29 September 1940 – Abort

The *Scire* departed La Spezia for an attack on the British at Gibraltar synchronized with the *Gondar* against Alexandria. On the same day the *Gondar* surfaced and received word the British had departed the *Scire* surfaced outside the straits of Gibraltar and received the same message concerning the British warships at Gibraltar, she aborted her attempt and returned to La Spezia.¹⁰²

Analysis: Stunned by the sudden loss of the *Iride* and the complete failure of their first attempt the two synchronized operations of the *Gondar* and *Scire* was a follow-up attack with the hopes of securing an early decisive blow with the new weapon. The limitations of Italian Naval Intelligence and communications with a submarine in-transit meant that the message to abort and return to Tobruk came too late and the *Gondar* was already off Alexandria and at risk of compromise. In a manner similar to the early detection of the *Calipso* as she transited to the Gulf of Bomba the Italians were unaware that the *Gondar* was compromised by sonar sweeps from the Australian destroyer HMAS *Stuart* while she was on the surface receiving messages and snorkeling.¹⁰³ These attacks are reflective of the original strategy and concept of employment of the SLCs: To attack the enemy's capital ships, in their forward operating harbors, early in the campaign, and in a synchronized manner at multiple locations. Following these failures and an aborted attempt Italian Naval planners' original hopes for a quick success will begin to be reevaluated. The great loss of equipment, manpower, and training time in rapid succession would lay the groundwork for a revision of strategy, doctrine, and tactics.¹⁰⁴

¹⁰¹ Borghese, *Sea Devils*, 44.

¹⁰² Borghese, 46.

¹⁰³ Greene and Massignani, *The Black Prince and the Sea Devils: The Story of Valerio Borghese and the Elite Units of the Decima Mas*, 57.

¹⁰⁴ Greene and Massignani, 58.

4. Submarine Scire SLC attack at Gibraltar 30 October 1940 – Failure

After departing La Spezia with three SLCs and their operators onboard, the *Scire* successfully passed the straits of Gibraltar and penetrated the Bay of Algeciras by hugging the Spanish coast and moving slowly until she was two miles from Gibraltar harbor and only three-hundred meters offshore at the mouth of the Guadarranque river.¹⁰⁵ The three SLCs are launched but each suffer various mechanical failures of their craft's navigation and control equipment that forced them to make their approach run on the surface. They are compromised by Anti-Submarine patrols surrounding Gibraltar, pursued and depth charged. Two SLC crews abort their attempts after damage to their craft and breathing devices; they scuttle their SLCs and breathing rigs and escape to Spain to link-up with agents for extraction.¹⁰⁶ One SLC pilot is successful in penetrating the harbor defense but his SLC malfunctioned on final attack approach and he placed his charge on the bottom near the battleship HMS *Barham*, which had no effect. He was then compromised on the surface and taken into custody.¹⁰⁷

Analysis: Despite earlier failures, Borghese, who was now in command of the *Scire*, states in his account that to be able to strike at the enemy when they are within their safe harbor became the motivating factor behind what he cites as the first truly coordinated attempt.¹⁰⁸ This is also the first of many attempts at Gibraltar and although due in large part to the skill of the *Scire*'s crew it validates the theory that a submarine can successfully penetrate the Bay of Algeciras to insert SLCs.¹⁰⁹ Of note for future operations is the proximity of the *Scire*'s release point of the SLCs to the Spanish coastline, and the first successful employment of clandestine networks in Spain to extract the SLC operators. As the doctrine and tactics of the *Decima* evolve these details will become more relevant in that once released from the host submarine the operators can no longer return to or be

¹⁰⁵ Borghese, *Sea Devils*, 57–61.

¹⁰⁶ Borghese, 64–65.

¹⁰⁷ Borghese, 66–67.

¹⁰⁸ Borghese, 56.

¹⁰⁹ Borghese, 71.

supported by it as it begins its own exfiltration.¹¹⁰ The lessons learned for the *Decima* is that heroic effort and physical exertion is not enough to overcome equipment failures and the stiff resistance of British ASW patrols. The effects of this operation also alerted the enemy to a new type of threat that was no longer a secret, after one of the scuttled SLCs washed ashore, and would lead to greater security and countermeasures being adopted.¹¹¹ Borghese considered the attack valuable experience for the submarine crew and SLC operators and a psychological success in that the enemy now had a sense of insecurity, especially among the merchant crews not normally anchored in the harbor proper. Finally, although increased countermeasures would make any further attempts at Gibraltar more difficult he believed the enormous amount of energy expended by the British to attempt to counter the threat in harbor previously believed safe was a victory for the *Decima* as well.¹¹²

5. Submarine Scire SLC Attack against Gibraltar 26 May 1941 – Failure

By May of 1941, the best attempt to eliminate the equipment shortfalls that had led to certain failures during the October 1940 attack at Gibraltar had been made and the SLC operators' training had been updated. To eliminate the ill effects of the long underwater transit onboard the *Scire* from La Spezia to Gibraltar the SLC operators were infiltrated by air into Spain before being transferred by Naval Intelligence assets to the port of Cadiz to be put aboard the Italian tanker *Fulgor* which had remained at harbor at Cadiz since the start of the war. In the meantime the *Scire* made the transit from La Spezia and came alongside the *Fulgor* to make the transfer of men and equipment before setting course to infiltrate Algeciras Bay.¹¹³ The rendezvous with the *Fulgor* also permitted Borghese to receive an intelligence update on the status of enemy vessels in the harbor at Gibraltar before getting underway. Once on station as before at the mouth of the Guadarranque River Borghese received the message, "Harbor is empty, all vessels having left during the

¹¹⁰ Greene and Massignani, *The Black Prince and the Sea Devils: The Story of Valerio Borghese and the Elite Units of the Decima Mas*, 62.

¹¹¹ Borghese, *Sea Devils*, 71.

¹¹² Borghese, 70–71.

¹¹³ Borghese, 85.

evening; operators will have to attack steamers in the roadstead.”¹¹⁴ At launch one of the three SLCs is completely inoperable and its warhead is taken in tow and the operators cross-loaded to the other two SLCs. Both remaining SLCs are forced to navigate on the surface by visual aid due to inoperable compasses. When attempting to place their respective charges both SLCs suffer from buoyancy issues and the men overexert themselves to the point of unconsciousness before abandoning their attempts.¹¹⁵ Each of the men evade enemy surface patrols during their surface swim back across the bay to Spain to link up with the assets awaiting to extract them.¹¹⁶

Analysis: Although the attack was a complete failure, and the SLCs are still plagued by equipment malfunctions, with one craft inoperable at the start and the other two with inoperable navigation equipment before becoming negatively buoyant and crash diving to the bottom during charge placement, this exercised a critical capability for future operations. The highlight of the operation was the testing and vetting of the new mechanism for infiltrating the operators into Spain and transferring them from the airport to the *Fulgor* and back with the help of local agents. This mechanism had operated flawlessly and had not aroused the suspicion of British Intelligence networks.¹¹⁷ This was the first use of cover names and identities by *Decima* operators and the first use of a forward location, in the form of the stationary *Fulgor*, codenamed *Base C*, to stage an attack.¹¹⁸

6. Sloop Diana SLC Attack at Malta 26 July 1941 – Failure

The next attempt, this time against Malta would be the worst failure of the *Decima* in the war. In their first combined approach the SLCs were not utilized as originally intended to deliver the decisive blow to enemy shipping. Instead the SLCs were assigned the supporting task of using their charges to breach the lines of harbor defenses to allow

¹¹⁴ Borghese, 88–90.

¹¹⁵ Borghese, 91.

¹¹⁶ Borghese, 93–94.

¹¹⁷ Borghese, 95.

¹¹⁸ Greene and Massignani, *The Black Prince and the Sea Devils: The Story of Valerio Borghese and the Elite Units of the Decima Mas*, 73.

the MAS surface craft to penetrate with their explosive payloads delivering the decisive blow. The sloop *Diana* was utilized as a support vessel for the transit to minimize risk to the MAS boats.¹¹⁹ Caught on the surface in the early hours of daylight the flotilla came under furious attack from British aviation and the garrison artillery. The results were devastating, a complete failure and 15 men dead, 18 taken prisoner, the loss of one large motorboat, eight smaller E type boats, the two SLCs, two Italian aircraft who arrived in support, and the towing vehicle for the MAS and SLCs.¹²⁰

Analysis: Following the repeated failures of the SLCs in the previous operations and the losses of submarines, equipment, and men what seems a desperate attempt to incorporate the SLCs into a combined assault resulted in the worst failure in a single operation for the *Decima*. The operation was compromised from the start. Unbeknownst to the Italians allied forces were prepared for an attack due to three indicators: British ULTRA operations had intercepted transmissions that an attack on Malta was imminent, the sloop *Diana* and the rest of the flotilla was detected by radar very early during final approach, finally the sound of the engines of the surface craft could be heard by the defenders for some time.¹²¹ The fatal lessons at Malta would reinforce that the underwater capability of the SLCs had always been intended as a surreptitious weapon and not one designed to assault a hardened and alert enemy position.

C. FIRST SUCCESS WITH THE NEW WEAPON

1. Submarine Scire SLC Attack against Gibraltar Sep 20–21 1941 – Success

One year after the breakout of hostilities, after many painful lessons learned the men of the *Decima* were ready for their first success with the SLCs. After again utilizing the now vetted mechanisms to infiltrate and transfer the operators from the *Fulgor* to the *Scire* at Cadiz the *Scire* came to rest at her now familiar location on the bottom of the

¹¹⁹ Greene and Massignani, 79–80.

¹²⁰ Borghese, *Sea Devils*, 111.

¹²¹ Greene and Massignani, *The Black Prince and the Sea Devils: The Story of Valerio Borghese and the Elite Units of the Decima Mas*, 81.

Algeciras at the mouth of the Guadarranque River on the evening of the 20th September. After receiving a telegram from the naval staff confirming the presence of British warships at Gibraltar Borghese tasked two SLCs to attack the *Nelson* class battleship, and the third SLC to attack the aircraft carrier HMS *Ark Royal* at anchorage.¹²² The three SLCs were launched without issues and made their approach on the surface in rough winds and seas. Each SLC had to evade active British ASW patrols as they made the transit across the Bay of Algeciras. As a result of the British patrols and countermeasures only one SLC penetrated the harbor while the other two made for the rows of steamers at anchor in the unprotected roadstead. All three SLC pilots chose targets of opportunity given the stiff resistance rather than their original assigned targets. After placing their charges and evading back to the Spanish coast they scuttled their craft and linked up at the prearranged location with their clandestine asset for exfiltration.¹²³ The following morning violent explosions rocked the bay and harbor at Gibraltar. Shortly after the tanker *Fiona Shells* and the merchant steamer *Durham* sank in the roadstead, while the tanker *Denby Dale* settled on the bottom of the harbor.¹²⁴ The *Decima* had achieved their first success with the SLCs, three vessels for a combined 30,000 tons had been sent to the bottom.¹²⁵

Analysis: This first success of the SLCs at Gibraltar was due largely in part to the experience gained from the previous failed attempts. The clandestine mechanisms in Spain used to infiltrate the operators was by now robust enough to make the event almost routine. Borghese and the crew of the *Scire* were also extremely familiar with the navigation required to successfully penetrate the Bay of Algeciras, and the operators chosen for the SLCs were all experienced men who were veterans of previous missions at Gibraltar.¹²⁶ In this manner the major phases of the previous operations had all been essentially full-dress rehearsals for this operation. A critical aspect toward the success of this operation

¹²² Borghese, *Sea Devils*, 120–22.

¹²³ Borghese, 122–27.

¹²⁴ Borghese, 128.

¹²⁵ Borghese, 127.

¹²⁶ Greene and Massignani, *The Black Prince and the Sea Devils: The Story of Valerio Borghese and the Elite Units of the Decima Mas*, 86.

was that at this point in the campaign the mechanical failures suffered by the SLCs had been remedied by this point. This was the first operation with SLCs where not a single craft had to abort due to equipment failure. The operators themselves after this mission felt the SLCs were finally reliable and effective weapons capable of delivering on early promises.¹²⁷ Of not during this operation was the new methods of active harbor defense employed by the British, the SLC operators faced for the first time silent electric boats equipped with hydrophones to detect the noise of their SLCs. Every SLC had to dive at least once to evade interception during their attack runs and it is likely that if the wind and sea state had been calmer they may have been intercepted.¹²⁸ As it was the operators were exposed to depth charges, which to an unprotected diver can be felt as well as heard. The British had adopted a tactic of randomly depth charging the bay and harbor to defend against underwater attack. This was critical in the decision process of the operators to attack less well guarded vessels as their targets rather than their assigned targets.¹²⁹ Finally, while the next attack at Alexandria may be more famous as the *Decima*'s first real success against enemy warships, this attack was unique to SLC operations in that not only were they successful in attacking target vessels but also all of the operators involved successfully exfiltrated. This fact will be critical to future *Decima* strategy and tactics.

2. Scire SLC Attack against Alexandria 18th December 1941 – Success

Following the success of the SLCs at Gibraltar, Borghese and the *Scire* with three SLCs and their operators are dispatched for an attack on Alexandria. On the evening of the 18th of December 1941, the *Scire* surfaced 1.3 miles off of Alexandria to launch the SLCs on what would be their most famous attack.¹³⁰ After the three SLCs were released the transit to the harbor entrance was uneventful and the calm seas allowed the SLCs to maintain contact with each other. By sheer luck as the SLC operators were searching for a way through the barriers a British destroyer approached, and they followed her through the

¹²⁷ Borghese, *Sea Devils*, 129.

¹²⁸ Borghese, 124.

¹²⁹ Borghese, 128.

¹³⁰ McRaven, *Spec Ops: Case Studies in Special Operations Warfare Theory & Practice*, 73.

opened net. Once inside the harbor depth charges become an issue of concern for the operators, randomly thrown into the harbor in the same manner as Gibraltar, the charges caused discomfort to the submerged limbs of the operators and forced them to make their approach on the surface, keeping their bodies as much out of the water as they could manage to reduce the impacts to their bodies.¹³¹ Once inside the harbor all three SLC crews successfully placed their charges on targets. By 0600 the following morning the charges began to detonate, sinking two battleships the HMS *Queen Elizabeth* and the HMS *Valiant*, the tanker HMS *Sagona*, and damaging the destroyer HMS *Jervis*, which had been alongside the *Sagona*.

3. Ambra SLC Attack against Alexandria 14 May 1942 – Failure

The spring following the December success at Alexandria the submarine *Ambra* with three SLCs attempted a similar attack. The *Ambra* had difficulty navigating and released the SLCs just over one mile from the planned insertion point. The SLC pilots are never able to get their bearings or identify visual reference points to guide them to the harbor at Alexandria. They are spotted on the surface during their approach and forced to take evasive action, becoming more disoriented in the process all men become lost and never able to get their bearings. With their batteries failing after the maneuvers they drove their SLCs to shore in the early morning light and were captured shortly after.

Analysis: The two attacks at Alexandria highlight the vast difference in outcome for the same mission profile if the submarine is of course.

D. A SHIFTING STRATEGY: ENTER THE GAMMA MEN

After many failures, limited success, and a large cost in men and equipment the *Decima* leadership reevaluated their strategy. Borghese remarks in his account that Gibraltar, being as it was the headquarters of the British fleet in the Western Mediterranean, had always been, along with Alexandria, a primary target. Recognizing as well that Italian aircraft were unable to penetrate the defenses, underwater attack was still the best option

¹³¹ Borghese, *Sea Devils*, 147.

due to its inherent surreptitiousness. After studying the three previous missions against Gibraltar the leadership of the *Decima* came to the following conclusions:¹³²

- It was an extremely high-risk operation to use a submarine to penetrate British antisubmarine countermeasures in the Bay of Algeciras for each attack on Gibraltar.¹³³
- A submarine's operational effectiveness was limited by several critical factors: Transit time from La Spezia, that it could only carry three SLCs at a time, and it was limited to conducting operations during the longer periods of darkness of the winter months.¹³⁴
- The special geographical position of Gibraltar, in such proximity to the neutral nation of Spain had enabled 22 of 24 operators to return from previous missions. Might it also then be more effective to attack targets in the Bay of Algeciras and Gibraltar from the Spanish coast?¹³⁵
- A new softer target had presented itself in the form of dozens of unprotected steamers at anchor in the roadstead outside the harbor, only hundreds of meters from the Spanish coast.¹³⁶

It was with this analysis that the *Decima* leadership began to shift the strategy of the underwater division from a Mahanian decisive blow to a Corbettian contested sea war on the periphery approach. Rather than relying on submarine insertion they would utilize their existing networks in Spain. If they could successfully infiltrate their operators from the Spanish coast operations could continue indefinitely, this would give the enemy no rest,

¹³² Borghese, 207.

¹³³ Borghese, 208.

¹³⁴ Borghese, 208.

¹³⁵ Borghese, 208.

¹³⁶ Borghese, 208.

and force them to commit increased antisubmarine resources toward an enemy they had no idea was actually coming from Spain.¹³⁷

1. Gamma Swimmer Attack from the Villa Carmella 14 July 1942 – Success

To facilitate attacking Gibraltar from Spain, a Petty officer in the *Decima*, Antonio Ramagnino, suggested a novel approach. Under the guise that his wife was ill and required the sun and sea-air of her home country to rehabilitate the newlyweds would honeymoon in a bungalow at Maiorga Point. There, on the North coast of Algeciras Bay, only four kilometers from Gibraltar, Antonio and his wife readied the house as an observation and staging point. They installed a window overlooking the bay, camouflaged to its true nature with a cage of parakeets. According to Borghese, in this way the brave and innovative actions of the young couple transformed the honeymoon bungalow of the Villa Carmella into the most advanced forward operating base of the Italian Navy in enemy territory.¹³⁸

Besides twenty-four-hour observation of the British activity around Gibraltar the Villa Carmella would allow the first use of the new Gamma swimmers. Without the need to breach the outer defenses into Gibraltar there would be no heavy equipment requirement. Furthermore, since their targets would be the thin-hulled merchant vessels the Gamma swimmers could simply swim out with a few “bug” mines on their belt, light and fast to conduct the attack.¹³⁹

The first Gamma unit to attack from the Villa Carmela was a twelve-man detachment led by LT Agostino Straulino. The men were smuggled into Spain in small groups, some overland by foot, some in the false-bottom of a truck, while others travelled in the guise as Italian merchant seaman who deserted once reaching the port of Cadiz in Spain.¹⁴⁰ Once they were together at the Villa Carmela Agostino and his men were afforded an opportunity that had never been available to the SLC pilots of previous

¹³⁷ Borghese, 208.

¹³⁸ Borghese, 209.

¹³⁹ Borghese, 209.

¹⁴⁰ Borghese, 210.

missions. They studied the rows of vessels during daylight hours and carefully planned their attack from their secure base at the honeymoon bungalow. After the necessary preparations, on the night of the 13th of July the men slipped into the water at the shoreline after simply walking from the Villa Carmela. Fresh and rested and wearing new lightweight Pirelli dry suits, rubber swim fins, and seaweed camouflaged head nets they swam out to their targets. They played a cat and mouse game with the British surface patrols as they attached explosives to their carefully planned and assigned targets and then evaded back to the Villa Carmela to regroup and enjoy a spot of warming brandy before linking up with Spanish agents to move to Cadiz and repatriation. The next morning four steamers in the roadstead, totaling almost ten thousand tons were seriously damaged when the Gamma swimmers' "bugs" detonated.¹⁴¹

Analysis: This first operation of the Gamma swimmers represents the high degree of innovation the Decima had achieved by this point. While the earlier attacks had relied on the SLC and therefore submarine or surface transport this new approach allowed attacks to be made without conventional naval assets and in doing so circumvented the British conventional detection systems and countermeasures. Borghese calls this first operation a stunning success, not only in its effect but in that the total cost was one man with back pain from the depth charges and another with a foot cut by a British motorboat screw. He also highlighted this operation as the first joint and interagency effort undertaken by the Italians, involving Navy, Army, and civilian intelligence assets and personnel to facilitate the clandestine organization that provided the infiltration and exfiltration mechanisms for the operators in Spain¹⁴² Finally, this operation represent the first true shift to an unconventional or irregular approach for the *Decima*. Whereas the previous missions could be viewed as an extension of submarine warfare, the *Scire* seemingly firing her SLC torpedoes with pilots serving as the terminal guidance to their targets. This operation is much more akin to a modern special operation, employing clandestine networks, cover

¹⁴¹ Borghese, 211–12.

¹⁴² Borghese, 212.

stories, and indigenous partisans, to facilitate highly trained operators utilizing underwater capability as a means to an end.

2. Scire Gamma Attempt on Haifa/El Daba 10 August 1942 – Failure

After the highly successful Gamma swimmer attack at Gibraltar the *Decima* attempted their final submarine insertion. The *Scire* was tasked to insert Gamma swimmers to attack shipping in the port of El Daba. In an illustration of the hazards to submarine operations highlighted above, the *Scire* was lost when she was detected on approach and sunk with all hands including the eleven Gamma men onboard.¹⁴³

E. THE PLOT THICKENS: THE STORY OF THE OLTERRA

When Italy entered the war the steamer *Oltorra* was scuttled in Spanish waters in the Bay of Algeciras across from Gibraltar, there she had remained in place for eighteen months, rusting and listing, the men aboard living out a meager existence to protect property rights. Ramognino, after his time at the Villa Carmela reported on the possibility of using her, with her Italian flag and innocent, forgotten state, as a secondary observation site.¹⁴⁴ The *Decima* dispatched an agent who approached the owner of the vessel concerning her potential use with a vague story citing the war needs of the Italian navy and he became, patriot that he was, a willing collaborator. A Spanish company was hired to refloat her and she was floated and towed to the end of the outer pier.¹⁴⁵ Decima officers then proposed that rather than utilize her as a simple observation point she could be refitted as a support point based directly across the roadstead from the stronghold of Gibraltar. The *Oltorra* could then be used as a fixed-base replacement for the parent submarine that had served as the launching vehicle for SLCs.¹⁴⁶ A cover plan was devised, a plan that would be carried out literally right in view of the windows of the British consulate in Spain. Under the command of a *Decima* officer a replacement “salvage crew” came aboard. This crew

¹⁴³ Borghese, 205.

¹⁴⁴ Borghese, 213.

¹⁴⁵ Borghese, 213.

¹⁴⁶ Borghese, 214.

was actually comprised of technicians and seamen of the *Decima*. To sell the ruse the crew spent time learning their assumed identities. Before they arrived they crewed aboard a civilian steamer moored near their training base in order to learn the “deck technique” the manner of the merchant seaman, his dress, slang, how he smoked, spat and ate, all in order to complete the deception that they were a salvage and refit merchant crew once they came aboard the *Olterra*.¹⁴⁷ The necessary equipment and work associated with a refit provided the cover needed to establish an entire workshop for the construction, launch and maintenance of SLCs. A compartment in the hold was even turned into a flooded test area to check buoyancy and water resistance of the new model of SLCs. An awning was constructed, seemingly for the purpose of protecting they crew from the sun while they worked to correct the listing in the ship. Its true purpose was to hide an opening cut into the side of the vessel connecting the inner flooded compartment to the sea to allow for clandestine, below the water line launch and recovery of SLCs.¹⁴⁸ In time the Spanish guards at the pier, the British Naval Intelligence officers working out of the consulate and the Spanish locals became very familiar with the noisy, dirty, unshaven and disheveled group of merchant sailors who often could be found frequenting a waterfront tavern or on payday seeking out the company of a local woman. They took no notice of them and even became familiar enough to call them by half Spanish-Italian nicknames. Never suspecting the work going on below decks in secret compartments within the *Olterra*.¹⁴⁹ The other advantage the *Olterra* provided, much like the Villa Carmela, was a continuous forward observation post to monitor and record the British patterns of harbor defense patrols, the timing of the opening of anti-torpedo nets, and the frequency and locations of depth charging. This was a level of intelligence that had never been realized until this point. A complete pattern of life for British operations in Gibraltar was developed during the *Olterra*’s “refit” and the construction of the SLCs below her decks. To obtain an even greater reconnaissance of British countermeasures fishing became a popular pastime of the

¹⁴⁷ Borghese, 214–15.

¹⁴⁸ Borghese, 214–15.

¹⁴⁹ Borghese, 215–16.

crew and afforded opportunities to confirm details of harbor defenses from a closer perspective without arousing the suspicion of the British security forces.¹⁵⁰

1. Villa Carmela 2nd Gamma Attack on Gibraltar 14–15 September 1942 – Success

While the conversion of the *Olterra* was underway, including the in-house construction of SLCs, a second Gamma swimmer operation was planned. Infiltrating as before by utilizing Spanish agents and the clandestine mechanisms in place, a team of five Gamma swimmers utilized the vantage point of the *Olterra* to plan and prepare for the operation. On the night of 14 September three Gamma swimmers staged at and departed from the Villa Carmela, while two remained in support and reserve. The swimmers were able to place their charges on their assigned target without compromise and by the morning of 15 September the Gamma men were already exfiltrating Spain on their way back to Italy as their charges detonated and the steamer *Raven's Point* sank in the roadstead.¹⁵¹

2. Olterra SLC Attack on Gibraltar 8 December 1942 – Failure

After months of preparation, three SLCs launched from below the waterline through the *Olterra's* secret door. All three suffered steering issues after launch and had to return to the *Olterra* to have them remedied before relaunching. Unfortunately for the operators, by this point the harbor defenses at Gibraltar were at their heaviest. Each SLC was caught on the surface and became the targets of machine gun fire and depth charges. The mission was aborted, but not before three men were killed and two captured in the attempt, with one man returning to the *Olterra*.¹⁵²

Analysis: Although ultimately a failure, due to the high level of active countermeasures employed by the British, this operation was the first operational success of the *Olterra* as a launch platform. This first SLC attempt from the *Olterra* was most notable in that this was the first operation that SLCs suffering mechanical issues could

¹⁵⁰ Borghese, 218–19.

¹⁵¹ Borghese, 219–20.

¹⁵² Borghese, 224–25.

return to their host launch platform for repairs and reset rather than simply aborting the mission, an advantage the *Olterra* had over the submarines that had been used as launch platforms in previous operations. By contrast, the Gamma operation carried out was executed flawlessly. The critical difference in the two operations carried out from the *Olterra* and the Villa Carmela is the reduced signature of the Gamma swimmers compared to the SLCs, which lent them more apt to slip by British patrols, and the nature of the targets. The soft targets of the steamers in the roadstead assigned to the Gamma men vs. the hardened target of the Gibraltar harbor assigned to the SLC pilots.

3. Ambra SLC and Gamma Joint Attack against Algiers 11 Dec 1942 – Success

Following the successful employment of the Gamma swimmers at Gibraltar the *Decima* attempted their first and only combined approach. On 11 December, the submarine *Ambra* successfully inserted three SLCs and ten Gamma swimmers outside the harbor. In another demonstration of a low-tech innovative approach to counter British detection equipment the *Ambra* reduced her electromagnetic signature on approach by using a Gamma swimmer on the surface as an observer connected via an underwater telephone to guide the submarine in while she remained submerged. Two SLCs were successful in sinking two vessels and damaging another. The Gamma swimmers successfully sunk two vessels. Unfortunately, without the safe haven of a nearby third-party nation like Spain at Gibraltar, or a clandestine exfiltration network, all sixteen operators were captured. The results against the enemy were also far less than *Decima* leadership had hoped given the commitment of such a large force of operators.¹⁵³

4. Olterra SLC 2nd Mission against Gibraltar 8 May 1943 – Success

After the failure of the 8 December, SLC operation it was decided that British defenses in the harbor at Gibraltar were too effective and focus shifted to the merchant shipping lying at anchor, since it was both nearer to the launch point and under less

¹⁵³ Borghese, 229–33.

protection.¹⁵⁴ On the evening of the 8 May, 1943, coordinated with the phase of the moon and a storm in the bay of Algeciras, making both hydrophonic and visual detection of the SLCs by the British more difficult, three SLCs were launched from the hidden door below the waterline in the *Olterra's* hull. Each craft was fitted with double warheads and assigned two targets, although the stormy weather and the British vigilance caused trouble for the SLCs, forcing each craft to repeat their attack runs, one crew six times (something they had never been able to do before during operations from the *Scire*) each SLC succeeded in mining one steam freighter each and successfully returned to the *Olterra* through the hidden opening. Rejoining their companion's topside as merchant seaman they waited for their charge timers to go off.¹⁵⁵ Then at six in the morning on the 9th the Bay of Algeciras was rocked by explosions. Within minutes the *Pat Harrison*, the *Mahsud*, and the *Camerata* each sank and were broken up for a total of 20,000 tons of enemy shipping sent to the bottom.¹⁵⁶

5. Olterra SLC Final Attack at Gibraltar 4 August 1943 – Success

In the final attack on Gibraltar on the night of 3 August, three SLCs launched from the *Olterra* succeeded in sinking the steamers *Harrison Gray Otis*, *Thorshovdi*, and the *Standridge* for a total of 23,000 tons.¹⁵⁷ Although the construction and launch of SLCs below deck on the *Olterra* had been refined to the point of becoming almost routine, and the SLC pilots' skills honed to the highest level, due to man-power shortages one inexperienced operator became separated from his SLC during the placing of the warhead on the *Harrison Gray Otis* when they encountered the latest British innovative countermeasure, barbed wire hanging from the hull. He was caught on the surface and captured shortly before the charges detonated.¹⁵⁸

¹⁵⁴ Borghese, 242.

¹⁵⁵ Borghese, 243.

¹⁵⁶ Borghese, 243.

¹⁵⁷ Borghese, 256.

¹⁵⁸ Borghese, 258.

Analysis: The final attacks by *Decima* SLC operators from the *Oltterra* represent the highest refinement of strategy, tactics, training, and equipment of the SLC group during the war. These attacks demonstrate the effectiveness of the synthesis of clandestine networks, forward operating bases, experienced operators, and reliable equipment. *Decima* deception efforts are also notable during this final phase in Gibraltar. During the attacks Spanish agents had scattered divers' equipment along the north coast of Gibraltar, in an effort to lead the British to believe that a submarine had penetrated the harbor and released the divers.¹⁵⁹ Borghese cites the testimony of Frank Goldsworthy, a British Naval Intelligence Officer at the time, years after the war, "We never found any proof of the part played by the *Oltterra* in this affair."¹⁶⁰ During the entire operational employment of the converted *Oltterra* the British never discovered the origin of the attacks.¹⁶¹ Figure 5 is a sketch of the Gibraltar operational area. Note the proximity of the Villa Carmella to the release point used by the *Scire* for SLC operations, also note the location of the *Oltterra* directly across the Bay of Algeciras and that these two forward operating positions provided ninety-degree observational perspective.

¹⁵⁹ Borghese, 244.

¹⁶⁰ Borghese, 244.

¹⁶¹ Borghese, 244.

bases were organized to attack invading fleets, at Cagliari a cavern was readied in the masonry of the mole to support underground swimmer operations against allied landings. With the aim of targeting enemy shipping by setting fire to petrol reserves that ran into the harbor once it was full of allied ships in support of an invasion.¹⁶³ Similar preparations were made at Syracuse, Augusta, and Catania to lie in wait for the British.¹⁶⁴ Small groups of swimmers were organized in neutral harbors, and under disguise they acted at night when enemy shipping presented itself, a base was established on board the Italian steamer *Gaeta*, and other bases camouflaged to blend in with the local scenery at Malaga, Barcelona, Lisbon, and Oporto.¹⁶⁵

Of each of these clandestine swimmer efforts the one that is the most well documented and what Borghese labelled the most brilliant enterprise, are Sub-Lieutenant Ferraro's secret missions. Italian Naval Intelligence had learned that the Turkish ports of Alexandretta and Mersina were being used to load chromium vital to the allied war effort. Luigi Ferraro, an athlete and expert swimmer, with the help of a Naval Intelligence specialist was assigned as an employee of the Ministry of Foreign Affairs and dispatched to the Italian consulate at Alexandretta.¹⁶⁶ A Naval Intelligence petty officer, who was intimately acquainted with a typist at the ministry of foreign affairs, had persuaded her to provide a passport, official paperwork, and the official rubber stamp to the *Decima*. In this way Ferraro, now under the guise of a consular employee reported with four heavy suitcases bearing diplomatic seals to the vice-consul at Alexandretta.¹⁶⁷ Ferraro was introduced quickly, by Giovanni Roccardi the clerk at the consulate, but really a naval secret service officer who had first brought to attention the possibility of attacking enemy shipping in port, into the local fashionable consular society.¹⁶⁸ As Ferraro became acquainted with his surroundings he could be spotted on the beach every day, where he

¹⁶³ Borghese, 244.

¹⁶⁴ Borghese, 245.

¹⁶⁵ Borghese, 248.

¹⁶⁶ Borghese, 249.

¹⁶⁷ Borghese, 250.

¹⁶⁸ Borghese, 250.

made it very apparent to any observer that although he enjoyed the beach, he could not swim. After the sun set every night he danced and drank at the local cafés. He was especially fond of and adept at playing hand ball and bowling on the beach, and every evening he carried a large box down to the waterfront from the Italian consul's beach house and he made a show of taking out the necessary gaming gear and used it in front of every one until it grew dark and he put it away for the night.¹⁶⁹ By 30 June 1943, any suspicion or curiosity about the new young Italian diplomat had faded away within the close-knit circles of the consulates and the British intelligence agents assigned to Ferraro and Roccardi had relaxed.¹⁷⁰

1. 17 Sub Lieutenant Ferraro's attack at Alexandretta 30 June 1943 – Success

On this evening Ferraro and Roccardi seemed more competitive than usual in a fierce game of bowling and didn't seem to notice as the sun went down and the usual crowd on the beach thinned. As soon as they were alone Ferraro used the beach cabin to change into his Pirelli dry suit, swim fins, oxygen rebreather, and seaweed net headdress. (the by now standardized garb of a Gamma swimmer). He also carried two limpet mines at his waist. He entered the water with Roccardi in overwatch and swam just over two kilometers until he reached the Greek vessel *Orion*, a 7000-ton freighter loaded with Chromium. He approached slowly and evaded search lights and sentries and used his lightweight breathing device to go sub-surface and attach his limpets to the bilge keel with clamps and armed the speed activated fuses by pulling the safety pins.¹⁷¹ He swam back to shore to link up with Roccardi and was dry and in the consulate by four the next morning. One week later the *Orion* had finished her unloading and weighed anchor, bound for the allied war effort. The limpets detonated in Syrian waters, she was so heavily laden she sank in minutes, and the survivors reported she had been torpedoed at sea.¹⁷²

¹⁶⁹ Borghese, 252.

¹⁷⁰ Borghese, 252.

¹⁷¹ Borghese, 252.

¹⁷² Borghese, 252.

2. 18 Ferraro's attack at Mersina 8 July 1943 – Success

On the 8th of July, at the neighboring port of Mersina. Ferraro and Roccardi had departed Alexandretta for the day with their diplomatic suitcases. After a day of bathing and games on the beach that evening at Mersina they returned the next day to Alexandretta unnoticed. The *Kaituna*, a freighter of 10,000 tons, who was also very modern and well equipped with armament, finished her onloading and departed on the 19th, once at sea one of the two limpets placed on her by Ferraro detonated and she barely avoided sinking by running aground on the coast of Cyprus.¹⁷³

3. 19 Ferraro's second attack at Mersina 30 July 1943 – Fail*

On the 30th of July, again at Mersina, Ferraro, wearing a bath robe over his dry suit and breathing device, walked down to the beach just after ten that night. Roccardi assisted him in his final equipment checks and preparing his limpet mines. Shortly before eleven he entered the water, swam four kilometers to reach his target, the *Sicilian Prince*, and was back ashore by four the next morning and back in Alexandretta a few hours later. Unfortunately, this target escaped due to Royal Navy clearance divers inspecting her hull before departure after the lesson of the *Kaituna*.¹⁷⁴

4. 20 Ferraro's second attack at Alexandretta 2 August 1943 – Success

On the 2nd of August Ferraro carried out his final attack. The Norwegian freighter *Fernplant*, of 7000 tons, loaded with chromium, was attacked in the same manner as his previous operations. Figure 6 depicts Ferraro's typical mission profile. When she made her final departure on the 5th she sunk after a few hours at sea. (Having even avoided a premature detonation during a movement on the 4th but the speed driven propellers on the limpets had not attained the necessary speed to arm the fuses.)¹⁷⁵ Having used up all his charges smuggled in diplomatic cases the consulate employee Ferraro came down with a sudden case of Malaria on the 8th of August and was sent to a hospital in Italy to recover.

¹⁷³ Borghese, 253.

¹⁷⁴ Borghese, 253.

¹⁷⁵ Borghese, 254.

In a single month Ferraro and Roccardi, acting alone and decentralized, had sunk or damaged 24,000 tons of shipping.¹⁷⁶

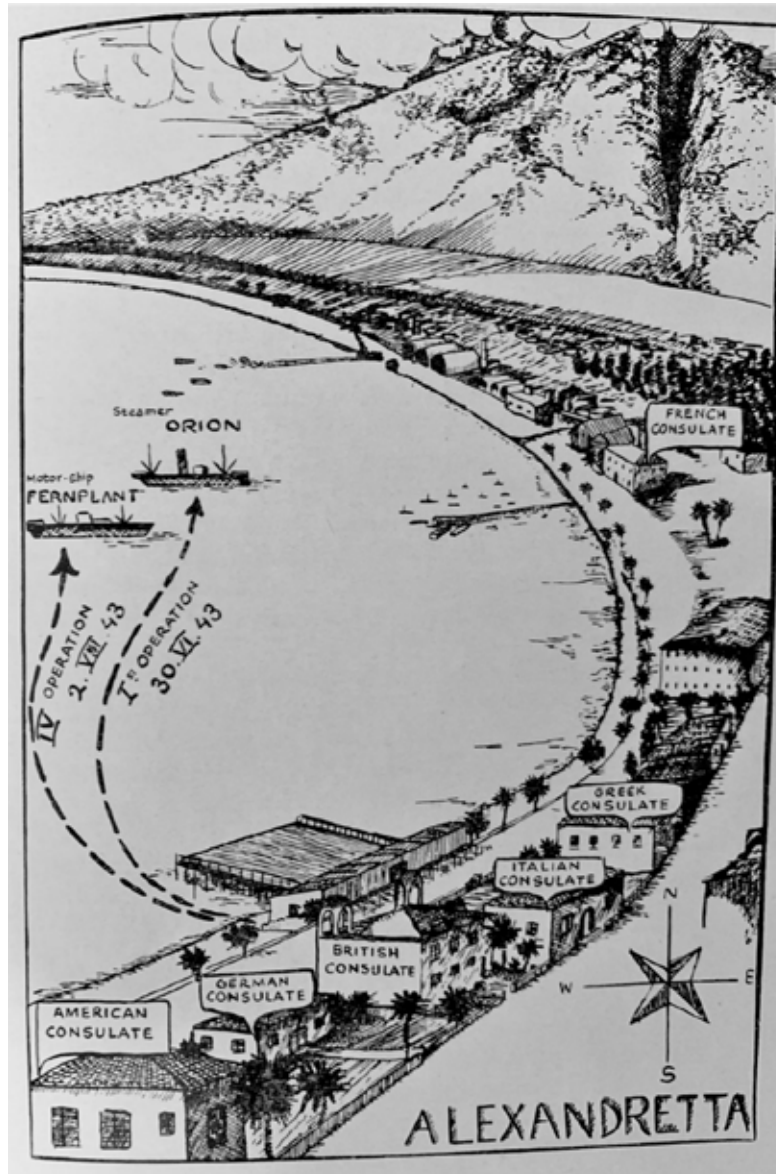


Figure 6. Ferraro's Gamma Operations¹⁷⁷

¹⁷⁶ Borghese, 254.

¹⁷⁷ Borghese, 253.

Analysis: If the final mission of the SLCs at Gibraltar represents the highest refinement for SLC operations, then the actions of Ferraro and Roccardi represent the highest level of refinement for the employment of Gamma swimmers. While Spain had provided a semi-permissive environment from which to operate through clandestine networks the consulate at Alexandretta provided a fully permissive environment from which to stage an attack. By this point in the war the *Decima* fully appreciate the value of overt cover as a means to infiltrate and stage underwater attacks. What is also notable is the final refinement of the limpet devices and the value of the time and speed fuse both in allowing the swimmer to exfiltrate the area and in non-attribution, in the one case the survivors even determining that they had been torpedoed at sea. Finally, Ferraro's missions represent the highest attainment of economy of force, and frequency of action, in that with a force of only two men and within a time span of a single month four operations are executed with a combined result of 24,000 tons of allied shipping and war materials destroyed.

G. STATISTICAL ANALYSIS OF *DECIMA MAS* UNDERWATER OPERATIONS

1. Introduction

Utilizing statistical analysis through a contingency table the twenty underwater operations of the *Decima MAS* can be analyzed for their effectiveness and cost. The *Decima* conducted underwater ship attacks through two primary means, either by SLC or Gamma swimmer attack. They also employed three methods of insertion of each force: submarine, surface vessel, and shore, which includes the converted *Olterra* lying pier side across from Gibraltar. Submarine-launched missions and the single mission against Malta using surface vessels can be grouped into a standard launch category. While by grouping shore launched missions such as those from the Villa Carmela in Spain and Ferraro's missions in Mersina and Alexandretta with the missions launched from the *Olterra* a non-standard category is created. Non-standard launched category vs. a standard-launched category are represented by "NS" and "S" respectively in the contingency table. Operations are further divided by the unit that conducted them into categories labelled SLC, and Gamma, or Joint for the single operation that employed both SLCs and Gamma swimmers. Finally, each operation

category is labeled S or F for success and failure, respectively. Traditionally the criterion for evaluation of success of *Decima* operations has simply been if the operation had the desired effect of disabling the target vessel.¹⁷⁸ That is the first criterion utilized in this analysis. Recognizing that other criteria in addition to effects on target are more useful to Special Operations planners, additional criteria are introduced that are relevant to the context of GPC and the modern employment of SOF. The first of these is the risk to force, defined by if the operation in question resulted in the death or capture of the operators. In today's politically sensitive environment and especially within the competitive space there is a much higher expectation by civilian and military leadership to reduce the risk that the special operators involved in an operation will become casualties or become compromised or captured than there was during World War II. The second additional criterion is, likelihood of attribution. Once again, given the context of today's competitive environment non-attribution lends options to SOF leadership both in lessening the potential political effects of an operation and in providing future options by not triggering an adversary to modify their defensive posture or counter-measures. The variety of *Decima* operations provides examples of both sides of these effects.

2. Success Criteria 1

Table 1. Success Criterion 1 Contingency Table

| Unit | S=S | S=F | NS=S | NS=F | Total |
|-------|-----|-----|------|------|-------|
| SLC | 2 | 7* | 2 | 1 | 12 |
| Gamma | 0 | 1** | 5 | 1*** | 7 |
| Joint | 1 | 0 | 0 | 0 | 1 |
| Total | 3 | 8 | 7 | 2 | 20 |

Probability Conclusions:

- Probability a random selected mission was a success? 11/20
- Used SLCs with standard insertion and success? 2/12

¹⁷⁸ West, "Frogmen 2.0: Combat Swimmers in the Era of Great Power Competition," 29.

- SLCs with non-standard insertion and success? 2/12
- SLC and success? 4/12
- Gamma swimmer with non-standard insertion and success? 5/7
- Gamma swimmer with standard insertion and success? 0/7
- Gamma swimmer and success? 5/7
- Standard insertion and success? 4/20
- Non-standard insertion and success? 7/20

3. Success Criteria 2

When the contingency table is redone with the additional criteria that only those operations in which the Operators from both SLC and Gamma groups were **both** able to carry out their ship attack **and** were not captured or killed as the definition of a successful operation the output shifts the success rate to that illustrated in Table 2.

Table 2. Success Criteria 2 Contingency Table

| Unit | S=S | S=F | NS=S | NS=F | Total |
|-------|-----|-----|------|------|-------|
| SLC | 1 | 8* | 1 | 2 | 12 |
| Gamma | 0 | 1** | 5 | 1*** | 7 |
| Joint | 0 | 1 | 0 | 0 | 1 |
| Total | 1 | 10 | 6 | 3 | 20 |

By these criteria, the original successes of the *Scire* SLC attack at Alexandria, the joint mission executed by the *Ambra* with both SLCs and Gamma swimmers against Algiers, and the *Olterra*'s final SLC mission at Gibraltar all shift to failure.

Probability Conclusions:

- Probability a random selected mission was a success? 7/20
- Used SLCs with standard insertion and success? 1/12
- SLCs with non-standard insertion and success? 1/12
- SLC and success? 2/12
- Gamma swimmer with non-standard insertion and success? 5/7, no change
- Gamma swimmer with sub insertion and success? 0/7, no change
- Gamma swimmer and success? 5/7, no change
- Standard insertion and success? 1/20
- Non-standard insertion and success? 6/20

4. Success Criteria 3

When the additional criterion is added that a successful mission must include **both** the placing of a charge that results in the disablement of the target vessel, the return of the operators, **and** that is non-attributional the success contingency table shifts thus:

Table 3. Success Criteria 3 Contingency Table

| Unit | S=S | S=F | NS=S | NS=F | Total |
|-------|-----|-----|------|------|-------|
| SLC | 0 | 9* | 1 | 2 | 12 |
| Gamma | 0 | 1** | 5 | 1*** | 7 |
| Joint | 0 | 1 | 0 | 0 | 1 |
| Total | 0 | 11 | 6 | 3 | 20 |

The single successful operation of the *Scire* with SLCs against Gibraltar was attributed to two-man submersible operations in the British admiralty report. Thus, the only operations that are considered successes by the additional criteria are those carried out by

Gamma swimmers operating from shore, or SLCs launched in a non-standard means from the *Olterra*.

Probability Conclusions

- Probability a random selected mission was a success? 6/20
- Used SLCs with standard insertion and success? 0
- SLCs with non-standard insertion and success? 1/12
- SLC and success? 1/12
- Gamma swimmer with non-standard insertion and success? 5/7, no change
- Gamma swimmer with standard insertion and success? 0/7, no change
- Gamma swimmer and success? 5/7, no change
- Standard insertion and success? 0
- Non-standard insertion and success? 6/20, no change

5. Conclusion

There is a strong relationship between the use of standard insertion and the likelihood of failure for *Decima MAS* underwater operations during World War II. When success is simply defined by the disablement of the target vessel a randomly chosen operation from the sample has an 11/20 chance of success. While an operation utilizing standard insertion has only a 4/20 chance of success. Furthermore, there is a slight relationship between the use of SLCs and failure, as a mission using SLCs has a 4/12 chance of success contrasted with a Gamma swimmer operation which has a 5/7 chance of success. An SLC operation using standard methods for initial insertion had only a 2/12 chance of success while a Gamma swimmer operation with non-standard insertion had a 5/7 chance of success. SLC and standard insertion operations represented the highest risk to success and the highest cost in resources, while the Gamma swimmer with non-standard

insertion was the highest chance of success with the lowest cost in resources at a four times greater chance of success (even after accounting for the Gamma operation thwarted by the RNCDs) without requiring submarine or surface vessel support or SLCs. When the additional criteria of the return of the operators and non-attribution is considered the trend continues to weight in favor of Gamma group and non-standard insertion methods. With a randomly selected mission from the table having a 6/20 chance of success, an SLC operation having a 1/12 chance of success, and SLCs and Gamma swimmers launched from standard methods zero chance of success. While the Gamma group inserted by non-standard means remains at the original 5/7 chance of success. This represents an almost nine times higher probability of success when defined by all three criteria for a Gamma swimmer inserted by non-standard methods over an SLC inserted by standard methods.

* Includes the aborted attempt by the *Scire* to attack Gibraltar

** This attempt the Gamma swimmers were never released, the submarine *Scire* was compromised and sunk on approach.

*** Although the attack was executed with success, this attempt is qualified as a failure due to Royal Navy Clearance Divers hull inspection before the charge detonated.

H. CONCLUDING ANALYSIS OF *DECIMA MAS* OPERATIONS

As the operational record has shown the *Decima MAS* underwater operations division shifted their focus from attacking hard targets with SLCs to an active defense utilizing Gamma swimmers targeting softer merchant shipping with miniaturized ordinance. This shift in tactics and equipment reflects an overall shift in strategy from a Mahanian approach to a Corbettian one. The shifting strategy of the *Decima MAS* played an overarching role in influencing doctrine, training, and technology adaptation. In the span of a thirty-six-month campaign their overall strategy, doctrine, tactics, and equipment was shifted to achieve a statistically significant shift from failure to success and from high to low cost in resources. So while the *Decima* may be most famous for their SLC operations against hardened targets like Alexandria, their lesser known but statistically less costly and more successful operations; such as the SLC launches from the *Oltterra* against Gibraltar and those conducted by Gamma swimmers at ports such as Mersina and Alexandretta

represent the greatest successes of the *Decima*. These are also the most relevant examples for modern SOF evaluating the feasibility of underwater operations within the context of Great Power Competition.

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V. FINDINGS AND RECOMMENDATIONS

A. FINDINGS APPLICABLE TO U.S. SOF

1. Organizational

a. *Small Group Innovation*

Small is beautiful, just as Jensen's theory suggests, small groups often produce the most innovative ideas. In the case of the *Decima* some of their most innovative and creative ideas were the result of junior officers and petty officers' suggestions. Ideas that would never have evolved from conventional naval leadership steeped in the traditions of capital ships of the line. Even the submarine officers, who arguably were already members of a smaller, less conventional, and more innovative arm, generally defaulted to utilizing the *Decima* operators as an extension of submarine warfare. Non-naval solutions such as operating from the Villa Carmela, the steamer *Olterra*, or the consulate at Alexandretta evolved from the minds of junior leaders looking to solve a problem outside of the bounds of their parent organization's traditional approach to the maritime domain.

b. *Flexible Doctrine*

One of the most difficult areas for a military organization to innovate is its doctrinal mindset, and often because of the deep-rooted bureaucracy that is often protected by and in turn supports it. In Jensen's *Forging the Sword* his case study of the U.S. Army examined the doctrinal change that occurred over a thirty-year period. What is stunning about the *Decima* case study in this research is the degree of doctrinal innovation the *Decima* achieved in a mere thirty-six months. They achieved this change against the same type of deep bureaucracy and tradition that is inherent to any conventional military organization. Even within their own underwater division, which was led by submarine officers, the *Decima* shifted their tactics from essentially submarine warfare to a maritime irregular warfare approach as a result of this foundational shift in doctrine.

c. *Incubators, Advocacy, and Leadership*

The *Decima* began as an extension of the Italian navy submarine force with an emphasis on undersea warfare centered around the employment of a weapon, the SLC. Within thirty-six months they were operating as a fully-fledged joint special operations unit centered on operational effects and utilizing their operators in the best manner to achieve the desired effects. This shift from a “man the equipment” weapons-centered approach to an “equip the man” human centered approach is a hallmark of shifting from conventional to a special operations or unconventional mindset. As stated above it reflects the importance of grass-roots ideas that shaped an evolving strategy, doctrine, and training plan. But these grass-roots idea incubators as Jensen labels them, would not have been successful in changing the organization without the advocacy of leadership within and outside of the organization. Leadership protected and encouraged the incubators and facilitated the advocacy network that led to the kind of rapid change that allowed the *Decima* to achieve their greatest success despite an alert and constantly evolving peer-level adversary.

2. *Operational*

a. *Forward Basing*

The *Decima* shifted their insertion methods from submarine launched to forward-based clandestine locations throughout the course of the campaign. As analysis has shown, this produced a statistically relevant improvement in the likelihood of mission success. Previous failures had been very often, as the case study has shown, due to the effectiveness of British early warning and detection equipment and anti-submarine warfare forces. By forward basing their SLC and Gamma groups they effectively rendered the detection ability of the British null by simply avoiding it. Additionally, as we have seen in the case of all three forward locations, these sites provided continuous intelligence through observation of enemy forces and the ability to attack quickly at targets of opportunity at any time. Forward basing improved the survivability of the *Decima* operators, provided an increased situational awareness, and allowed a higher frequency of operations.

b. Local clandestine networks

As the study has shown a critical factor toward making forward basing a success was that it was facilitated by local clandestine networks. These same networks also facilitated the return of the *Decima* operators as well. Clandestine support networks enabled the forward-basing and therefore the circumventing of the British primary means of countering *Decima* underwater operations. By allowing the return of the operators the networks and the mechanisms they established greatly reduced the risk to force, additionally, the return of the operators reduced the cost of the operations in man power and training. Contrast the success at Alexandria of the SLCs after which all operators were captured to the SLC operations at Gibraltar where the operators returned to fight another day.

c. Target Selection

As the *Decima* shifted their strategy and in turn modified their doctrine, they also shifted their focus from hard to soft targets. No longer seeking a decisive knock-out blow against British ships of the line they were able to take advantage of the softer unprotected shipping targets that presented themselves outside of the secure harbors. In this manner they transitioned to shaping the battlefield over a sustained campaign instead of attempting to rebalance power quickly. As the *Decima* learned, combat divers are extremely vulnerable to even mild counter measures, and a vigilant opponent can render subsurface offensive operations all but impossible. The allies did not have the resources to defend all the shipping, and this shift in *Decima* operations allowed them to maximize their strengths against the enemies' vulnerabilities rather than curtailing operations.

B. RECOMMENDATIONS FOR U.S. SPECIAL FORCES

1. Context and Challenges

In the introduction chapter this study highlighted that while the joint operational environment of Iraq and Afghanistan has led to greater interoperability between U.S. SOF conducting joint and combined land operations the same has not extend to the maritime domain. That chapter also highlighted that often the very suggestion of non-Naval SOF

conducting maritime or underwater operations is met with great institutional resistance. This is especially true within the Special Forces Regiment despite the fact that there is both the doctrinal mandate and historical precedence for each SOF service to maintain an underwater capability.¹⁷⁹ This study posits that this organizational resistance is attributed to three shortfalls: An inflexible Doctrine, “Sea Blindness,” and Multi-Domain atrophy.

2. Doctrine

An assumption for this study is that Special Forces core missions and tasks will required to be executed throughout a multi-domain environment regardless of service branch.¹⁸⁰ Yet while there is standardization and interoperability in underwater equipment and training among U.S. SOF, the doctrinal guidance for the use of underwater capability by Special Forces is limited to infiltration and reconnaissance and primarily conflict-focused.¹⁸¹ This limitation ignores both the potential for Army Special Forces to utilize underwater capability in gaining access to partner forces as a means of maintaining forward presence and influence within Great Power Competition. The doctrinal mindset also governs the training in that the cumulative exercises focus on ODA infiltration of a denied area to conduct other missions.¹⁸² While it is certainly one aspect of underwater capability, a more likely scenario and one relevant to Great Power Competition is the training, and enabling of local partner or indigenous forces in the use of underwater methods of mobility to conduct various forms of reconnaissance, clandestine movement, and maritime disablement and sabotage. Doctrine that would allow for Army Special Forces to train on and execute maritime sabotage would enable an institutional mindset switch in a manner much like the *Decima*. It would also allow for a greater integration of forward based indigenous maritime clandestine networks into any future underwater operations in the event of conflict. Finally, by overtly working with partners in this doctrinal approach

¹⁷⁹ Air Land Sea Application Center, *Multi-Service Tactics, Techniques, and Procedures for Military Diving Operations*, 1.

¹⁸⁰ *Doctrine For Army Special Operations Forces FM 100-25*, 1–1.

¹⁸¹ Air Land Sea Application Center, *Multi-Service Tactics, Techniques, and Procedures for Military Diving Operations*, 57.

greater resistance, resilience, and influence could be fostered and serve as a potential cost-inducer and deterrent to America's adversaries within the competitive space.

3. Sea Blindness

A doctrinal shift in the application of Army Special Forces underwater capability would also lead to a reduced "Sea Blindness" in the force. As stated in the introductory chapter these terrain-based blinders inhibit SOF planners from recognizing the maritime domain and littoral regions as maneuver space. Instead regarding the maritime domain and the littorals as an obstacle to be overcome rather than an area of opportunity.¹⁸³ At the same time Violent Extremist Organizations (VEOs) and illicit groups have taken full advantage of the gaps and seams in these areas. Correcting Sea Blindness would enable greater illumination of VEO activity in the littorals, while also permitting forward presence that would counter Great Power and in particular Chinese Maritime Grand Strategy, while providing indigenous networks that would enable the potential use of underwater capability.

4. Multi-domain Atrophy

As stated before, these fundamental shortfalls have produced a disparity between doctrine, training, and operational employment within the Special Forces underwater operations community. A flexible doctrine, and increased awareness of the potential for underwater operations to build partner capacity, gain a forward presence and influence, illuminate VEO networks, and remain competitive in the GPC arena will prioritize the fostering of protective leadership and advocacy groups within the Special Forces Regiment and the greater SOF community to encourage the incubation of new ideas and innovative technology approaches. This will correct the multi-domain atrophy that has taken place over the last two decades and provide another tool in the kit bag for Special Forces to remain the preferred partner in the competitive realm.

¹⁸³ Meghan Curran Et Al., "Violence At Sea: How Terrorists, Insurgents, And Other Extremists Exploit The Maritime Domain," Stable Seas, August 2020, 1.

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APPENDIX: INTERVIEW QUESTIONS

How is the Program of Instruction (POI) developed?

What is the annual throughput of the course, does this meet operational demand?

How often is the POI reviewed? Who approves it?

Does the POI reflect current operational priorities of units in the field? What Methods determine this?

Is there a method to capture and record lessons learned from training? The operational force?

What type if any collaboration takes place with the sister service schoolhouses? Does this program train the joint force? Annual throughput?

Is there a formalized feedback method for the operational force to provide input on the end user product?

Is there a method to conduct research, development, or innovation in equipment, TTPs, POI development?

Does the schoolhouse have the authority to test/certify new equipment for the force? If the schoolhouse does not have this authority what method exists to communicate operational requirements to the testing authority?

Does the schoolhouse provide advanced training opportunities to operational units? How often annually? What is the method for scheduling with the force?

Does the schoolhouse coordinate for training with conventional units outside the SOF community? NATO SOF or conventional forces? How often annually?

Is the schoolhouse available for foreign partner nation students to attend? How many and which nations annually?

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